



CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

Regular Meeting of the Board of Directors

9:00 a.m.

Wednesday, December 14, 2022

Lowell H. Lebermann, Jr., Board Room
3300 N. IH-35, Suite 300
Austin, Texas 78705

*A live video stream of this meeting may be viewed on the internet at
www.mobilityauthority.com*

Persons with disabilities. If you plan to attend this meeting and may need auxiliary aids or services, such as an interpreter for those who are deaf or hearing impaired, or if you are a reader of large print or Braille, please contact Laura Bohl at (512) 996-9778 at least two days before the meeting so that appropriate arrangements can be made.

Español. Si desea recibir asistencia gratuita para traducir esta información, llame al (512) 996-9778.

AGENDA

No action on the following:

1. Welcome and opportunity for public comment – See **Notes** at the end of this agenda.

Consent Agenda

*See **Notes** at the end of this agenda.*

2. Approve the minutes from the October 26, 2022 Regular Board Meeting.
3. Prohibit the operation of certain vehicles on Mobility Authority toll facilities pursuant to the Habitual Violator Program.
4. Approve an interlocal agreement with the Texas Department of Transportation for the construction of the Mobility Authority's payment windows at the TxTag Ridgepoint Customer Service Center.

5. Approve the annual compliance report for submittal to the Texas Department of Transportation as required by 43 Texas Administrative Code §26.65.
6. Approve a contract with Aaron Concrete Contractors, LP for the 290E Retaining Wall Stabilization Maintenance Project.
7. Approve additional funding to extend the agreement with Robert Half International, Inc. for Interim Controller services.

Regular Items

Items to discuss, consider, and take appropriate action.

8. Accept the financial statements for September 2022 and October 2022.
9. Discuss and consider awarding and approving the award and execution of contracts for construction engineering and inspection services (CE&I) with BGE, Inc. and IEA Inc. for the CE&I Services Pool.
10. Discuss and consider approving an amended and restated agreement with Electronic Transaction Consultants, LLC (ETC) for electronic toll collection integration and maintenance services.
11. Discuss and consider approving Work Authorization No. 4 with Electronic Transaction Consultants, LLC (ETC) for the design and installation of the toll system and other infrastructure required to support the 183N Mobility Project.
12. Discuss and consider approving Work Authorization No. 5 with Electronic Transaction Consultants, LLC (ETC) for the design and installation of the toll system and other infrastructure required to support the 183A Phase III Project.

Briefings and Reports

Items for briefing and discussion only. No action will be taken by the Board.

13. Executive Director Report.
 - A. Mobility Authority office plan.
 - B. Agency performance metrics.
 - (i) Roadway performance
 - (ii) Call-Center performance

Executive Session

Under Chapter 551 of the Texas Government Code, the Board may recess into a closed meeting (an executive session) to deliberate any item on this agenda if the Chairman announces the item will be deliberated in executive session and identifies the section or sections of Chapter 551 that authorize meeting in executive session. A final action, decision, or vote on a matter deliberated in executive session will be made only after the Board reconvenes in an open meeting.

The Board may deliberate the following items in executive session if announced by the Chairman:

14. Discuss the sale, transfer, or exchange of one or more parcels or interests in real property owned by the Mobility Authority and related legal issues as authorized by §551.071 (Consultation with Attorney) and §551.072 (Deliberation Regarding Real Property).
15. Discuss legal issues related to claims by or against the Mobility Authority; pending or contemplated litigation and any related settlement offers; or other matters as authorized by §551.071 (Consultation with Attorney).
16. Discuss legal issues relating to procurement and financing of Mobility Authority transportation projects and toll system improvements, as authorized by §551.071 (Consultation with Attorney).
17. Discuss personnel matters as authorized by §551.074 (Personnel Matters).

Reconvene in Open Session.

Regular Items

Items to discuss, consider, and take appropriate action.

18. Adjourn meeting.

Notes

Opportunity for Public Comment. At the beginning of the meeting, the Board provides a period of up to one hour for public comment on any matter subject to the Mobility Authority's jurisdiction. Each speaker is allowed a maximum of three minutes. A person who wishes to address the Board must register in advance and provide the speaker's name, address, phone number and email, as well as the agenda item number and whether you wish to speak during the public comment period or during the agenda item. If a speaker's topic is not listed on this agenda, the Board may not deliberate the speaker's topic or question the speaker during the open comment period but may direct staff to investigate the matter or propose that an item be placed on a subsequent agenda for deliberation and possible action by the Board. The Board may not deliberate or act on an item that is not listed on this agenda.

Consent Agenda. The Consent Agenda includes routine or recurring items for Board action with a single vote. The Chairman or any Board Member may defer action on a Consent Agenda item for discussion and consideration by the Board with the other Regular Items.

*Mobility Authority Board Meeting Agenda
Wednesday, December 14, 2022*

Public Comment on Agenda Items. A member of the public may offer comments on a specific agenda item in open session if he or she signs the speaker registration sheet for that item before the Board takes up consideration of the item. The Chairman may limit the amount of time allowed for each speaker. Public comment unrelated to a specific agenda item must be offered during the open comment period.

Meeting Procedures. The order and numbering of agenda items is for ease of reference only. After the meeting is convened, the Chairman may rearrange the order in which agenda items are considered, and the Board may consider items on the agenda in any order or at any time during the meeting.

Participation by Telephone Conference Call. One or more members of the Board of Directors may participate in this meeting through a telephone conference call, as authorized by Sec. 370.262, Texas Transportation Code (*see below*). Under that law, each part of the telephone conference call meeting that by law must be open to the public, shall be audible to the public at the meeting location, and will be tape-recorded or documented by written minutes. On conclusion of the meeting, the tape recording or the written minutes of the meeting will be made available to the public.

TEXAS TRANSPORTATION CODE Sec. 370.262. MEETINGS BY TELEPHONE CONFERENCE CALL.

(a) Chapter 551, Government Code, does not prohibit any open or closed meeting of the board, a committee of the board, or the staff, or any combination of the board or staff, from being held by telephone conference call. The board may hold an open or closed meeting by telephone conference call subject to the requirements of Sections 551.125(c)-(f), Government Code, but is not subject to the requirements of Subsection (b) of that section.

(b) A telephone conference call meeting is subject to the notice requirements applicable to other meetings.

(c) Notice of a telephone conference call meeting that by law must be open to the public must specify the location of the meeting. The location must be a conference room of the authority or other facility in a county of the authority that is accessible to the public.

(d) Each part of the telephone conference call meeting that by law must be open to the public shall be audible to the public at the location specified in the notice and shall be tape-recorded or documented by written minutes. On conclusion of the meeting, the tape recording or the written minutes of the meeting shall be made available to the public.

TEXAS GOVERNMENT CODE Sec. 551.125. OTHER GOVERNMENTAL BODY. (a) Except as otherwise provided by this subchapter, this chapter does not prohibit a governmental body from holding an open or closed meeting by telephone conference call.

~~(b) A meeting held by telephone conference call may be held only if:~~

~~(1) an emergency or public necessity exists within the meaning of Section 551.045 of this chapter; and~~

~~(2) the convening at one location of a quorum of the governmental body is difficult or impossible; or~~

~~(3) the meeting is held by an advisory board.~~

(c) The telephone conference call meeting is subject to the notice requirements applicable to other meetings.

(d) The notice of the telephone conference call meeting must specify as the location of the meeting the location where meetings of the governmental body are usually held.

(e) Each part of the telephone conference call meeting that is required to be open to the public shall be audible to the public at the location specified in the notice of the meeting as the location of the meeting and shall be tape-recorded. The tape recording shall be made available to the public.

(f) The location designated in the notice as the location of the meeting shall provide two-way communication during the entire telephone conference call meeting and the identification of each party to the telephone conference shall be clearly stated prior to speaking.



CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

December 14, 2022
AGENDA ITEM #1

Welcome and opportunity for public
comment

Welcome and opportunity for public comment.
No Board action required.



CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

December 14, 2022
AGENDA ITEM #2

Approve the minutes from the
October 26, 2022 Regular Board
Meeting

Strategic Plan Relevance: Service
Department: Legal
Contact: Geoff Petrov, General Counsel
Associated Costs: N/A
Funding Source: N/A
Action Requested: Consider and act on motion to approve minutes

Description/Background: Approve the attached draft minutes for the October 26, 2022, Regular Board Meeting.

Backup provided: Draft minutes

MINUTES

Regular Meeting of the Board of Directors of the CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

Wednesday, October 26, 2022

9:00 a.m.

This was an in-person meeting. Notice of the meeting was posted October 21, 2022, online on the website of the Mobility Authority and in the Mobility Authority's office lobby at 3300 N. Interstate 35, #300, Austin, Texas 78705-1849. Chairman Robert Jenkins, Vice Chair Nikelle Meade and Board Members David Singleton, David Armbrust, Heather Gaddes and Jay Blazek Crossley were present in the Lebermann Board Room.

An archived copy of the live-streamed audio of this meeting is available at:

<https://mobilityauthority.swagit.com/play/10262022-832>

After noting that a quorum of the Board was present, Chairman Jenkins called the meeting to order at 9:02 a.m. and had each Board Member state their name for the record.

1. Welcome and opportunity for public comment.

Chairman Jenkins announced a speaker signed up to address the Board under Item 8.

2. **Audit Committee Meeting:**

Chairman Jenkins recessed the regular meeting of the Board of Directors and David Singleton, Chairman of the Audit Committee, called the Audit Committee Meeting to order at 9:04 a.m.

- A. Audit Committee meeting called to order by Committee Chairman Singleton.
- B. Jose Hernandez, Chief Financial Officer, introduced auditors Joel Perez, Partner, Marc Sewell, Partner and Tino Robledo, Senior Manager with RSM US, LLP.

Joel Perez, Partner, RSM US, LLP introduced Marc Sewell, Partner, RSM US, LLP who presented the Fiscal Year 2022 Audit Reports and Tino Robledo, Senior Manager with RSM US, LLP presented on the required communication portion of the Fiscal Year 2022 Audit.

- C. Discuss, consider, and take appropriate action to accept the Fiscal Year 2022 Audit Reports.

Following the Board discussion, Audit Committee Chairman Singleton entertained a motion to accept the Fiscal Year 2022 Audit Reports.

MOTION: Accept the Fiscal Year 2022 Audit Reports subject to final determination of contingency items.

RESULT: Approved (Unanimous); 6-0

MOTION: David Armbrust

SECONDED BY: Nikelle Meade

AYE: Armbrust, Crossley, Gaddes, Jenkins, Meade, Singleton

NAY: None.

ADOPTED AS: **RESOLUTION NO. 22-046**

- D. Adjourn Audit Committee.

David Singleton adjourned the Audit Committee and Chairman Jenkins reconvened the regular meeting of the Board of Directors 9:19 a.m.

Consent Agenda

3. Approve the minutes from the September 28, 2022 Regular Board Meeting.
4. Prohibit the operation of certain vehicles on Mobility Authority toll facilities pursuant to the Habitual Violator Program.

ADOPTED AS: **RESOLUTION NO. 22-047**

MOTION: Approve Item Nos. 3 and 4.

RESULT: Approved (Unanimous); 6-0

MOTION: Nikelle Meade

SECONDED BY: David Singleton

AYE: Armbrust, Crossley, Gaddes, Jenkins, Meade, Singleton

NAY: None.

Regular Items

5. Discuss and consider amending the Mobility Authority Policy Code § 301.012 to clarify the purpose of Article 10 of the Mobility Authority Policy Code.

Presentation by James M. Bass, Executive Director.

MOTION: Amend the Mobility Authority Policy Code § 301.012 to clarify the purpose of Article 10 of the Mobility Authority Policy Code

RESULT: Approved (Unanimous); 6-0

MOTION: Jay Crossley

SECONDED BY: Heather Gaddes

AYE: Armbrust, Crossley, Gaddes, Jenkins, Meade, Singleton

NAY: None.

ADOPTED AS: **RESOLUTION NO. 22-048**

6. Discuss and consider modifying the annual toll rate escalation becoming effective on January 1, 2023.

Presentation by Jose Hernandez, Chief Financial Officer.

7. Discuss and consider approving a request to Issue a Request for Proposals (RFP) for Intelligent Transportation System (ITS) Performance-based Maintenance Services with an allowance for an Executive Director approved shortlist.

Note: Nikelle Meade stepped away from the dais but attended and voted remotely.

Presentation by Greg Mack, Director of Information Technology.

MOTION: Approve a request to Issue a Request for Proposals (RFP) for Intelligent Transportation System (ITS) Performance-based Maintenance Services with an allowance for an Executive Director approved shortlist.

RESULT: Approved (Unanimous); 6-0

MOTION: Heather Gaddes

SECONDED BY: David Singleton

AYE: Armbrust, Crossley, Gaddes, Jenkins, Meade, Singleton

NAY: None.

ADOPTED AS: RESOLUTION NO. 22-049

8. Discuss and consider approving a contract with Tight Line Construction, LLC for landscape improvements at Austin’s Memorial Park Cemetery.

Sharon Blythe, Director, Rescue Austin Memorial Park Cemetery provided public comment.

Presentation by Mike Sexton, P.E., Acting Director of Engineering.

MOTION: Approve a contract with Tight Line Construction, LLC for landscape improvements at Austin’s Memorial Park Cemetery.

RESULT: Approved (Unanimous); 6-0

MOTION: David Singleton

SECONDED BY: Heather Gaddes

AYE: Armbrust, Crossley, Gaddes, Jenkins, Meade, Singleton

NAY: None.

ADOPTED AS: RESOLUTION NO. 22-050

Briefings and Reports

9. Quarterly Project updates.

Presentation by Mike Sexton P.E., Acting Director of Engineering.

- A. 183A Phase III Project
- B. 183 North Mobility Project

10. Executive Director Board Report

Presentation by James M. Bass, Executive Director.

- A. Agency performance metrics.
 - (i) Roadway performance
 - (ii) Call-Center performance
- B. New employee introductions.

Executive Session

Chairman Jenkins announced in open session at 10:25 a.m. that the Board would recess the meeting and reconvene in Executive Session to deliberate the following items:

- 11.** Discuss the sale, transfer, or exchange of one or more parcels or interests in real property owned by the Mobility Authority and related legal issues as authorized by §551.071 (Consultation with Attorney) and §551.072 (Deliberation Regarding Real Property; Closed Meeting).
- 12.** Discuss legal issues related to claims by or against the Mobility Authority; pending or contemplated litigation and any related settlement offers; or other matters as authorized by §551.071 (Consultation with Attorney).
- 13.** Discuss legal issues relating to procurement and financing of Mobility Authority transportation projects and toll system improvements, as authorized by §551.071 (Consultation with Attorney).
- 14.** Discuss personnel matters as authorized by §551.074 (Personnel Matters).

After completing the executive session, the Board reconvened in open meeting at 10:56 a.m.

Note: Nikelle Meade joined the dais following Executive Session.

Regular Items

- 15.** Adjourn Meeting.

After confirming that no member of the public wished to address the Board, Chairman Jenkins declared the meeting adjourned at 10:56 a.m.



CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

December 14, 2022 AGENDA ITEM #3

Prohibit the operation of certain
vehicles on Mobility Authority toll
facilities pursuant to the Habitual
Violator Program

Strategic Plan Relevance:	Stewardship & Service
Department:	Operations
Contact:	Tracie Brown, Director of Operations
Associated Costs:	N/A
Funding Source:	N/A
Action Requested:	Consider and act on draft resolution

Project Description/Background: The Mobility Authority's habitual violator process prescribes two notices before habitual violator remedies go into effect. A pre-determination letter is sent 60 days before any remedies are enforced advising the customer again of their outstanding balance and providing an opportunity for resolution. Assuming no resolution, a *Notice of Determination* is mailed notifying the customer they've been determined to be a habitual violator and advising of the consequences. The customer is also informed of their right to appeal the decision and the process by which to do so.

If the customer does not contact the Authority to appeal the habitual violator determination or resolve their outstanding balance, a block is placed on the related vehicle's registration preventing renewal. The block remains in effect until all tolls and fees have been paid, a payment plan has been arranged with the Mobility Authority or the customer is determined to no longer be a habitual violator.

Previous Actions & Brief History of the Program/Project: State law provides that persons deemed to be habitual violators may also be prohibited from use of the Mobility Authority's toll facilities by order of the Board of Directors. Habitual violator customers operating a vehicle in violation of a ban are subject to a Class C misdemeanor with a fine up to \$500. A second or subsequent occurrence may result in impoundment of the vehicle. Similar to registration blocks, vehicle bans remain in effect until all

outstanding amounts owed to the Authority have been resolved or the customer is no longer deemed a habitual violator.

Financing: Not applicable.

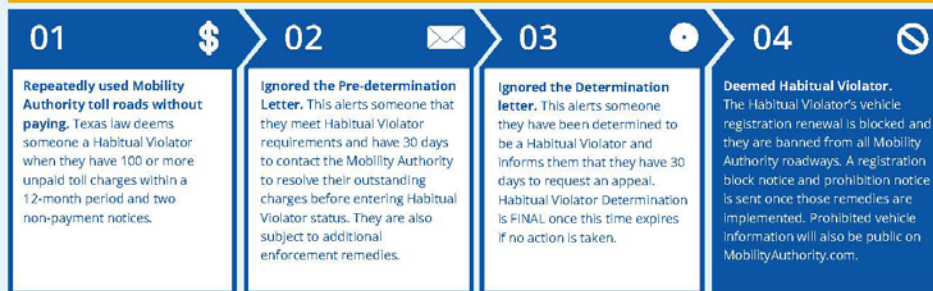
Action requested/Staff Recommendation: Staff affirms that all required steps have been followed and proper notice previously provided to customers determined to be habitual violators. To date, these customers have not appealed this determination or resolved their outstanding balances.

Therefore, staff recommends that the Board of Directors approve the order prohibiting certain vehicles from use of the Authority's toll facilities. Following the Board's approval of this order, a Notice of Prohibition will be mailed by first class mail advising of the ban, consequences if the ban is violated and how the customer may resolve their outstanding balance.

Backup provided: Habitual Violator Vehicle Ban FAQs
Draft Resolution



Habitual Violator Process



Who is a Habitual Violator?

A Habitual Violator is defined in Section 372.106(a) of the Texas Transportation Code as (A) one who was issued at least two written notices of nonpayment that contained in aggregate 100 or more events of nonpayment within a period of one year and, (B) was issued a warning that failure to pay the amounts specified in the notices may result in the toll project entity's exercise of Habitual Violator remedies.

What enforcement remedies is the Mobility Authority implementing for Habitual Violators?

To encourage equitable payment by all customers, legislation allows for enforcement remedies up to and including vehicle registration renewal blocks, prohibiting Habitual Violator's vehicles on Mobility Authority roadways, on-road enforcement of the vehicle ban, as well as posting names to the agency website of those Habitual Violators with banned vehicles. The Mobility Authority will be implementing these remedies beginning November 2019.

How will I know I'm a Habitual Violator subject to enforcement remedies?

Habitual Violators are provided due process protections prior to any enforcement action.

- A registered vehicle owner who the Mobility Authority determines meets the Habitual Violator status is sent a letter advising them that Habitual Violator remedies may be implemented if the customer's outstanding balance is not resolved. This letter is not required by law but is sent as a courtesy to reflect the Mobility Authority's commitment to the customer.
- A registered vehicle owner who the Mobility Authority determines to be a Habitual Violator receives written notice of that determination and an opportunity for a justice of the peace hearing to challenge their Habitual Violator status.
- Habitual Violator Determination is FINAL if no action is taken, prompt in the Mobility Authority to send a Vehicle Registration Block Notice and/or a Vehicle Ban Notice. These notices urge the Habitual Violator yet again to resolve their toll debt with the Mobility Authority.
- Sufficient time is provided to respond to all notifications.

Learn more about the Habitual Violator Enforcement Program at MobilityAuthority.com



How can I resolve my Habitual Violator status and settle my toll bill balance?

You can pay outstanding tolls and administrative fees with cash, money order or credit card (a payment plan may be available) by: calling the Mobility Authority Customer Service Center at 512-410-0562, online at www.paymobilitybill.com, or in person at our walk-up center.

Why is the Mobility Authority pursuing enforcement remedies?

The vehicle registration block and other toll enforcement actions are intended to encourage tollway drivers to pay for services rendered to ensure fairness to the overwhelming majority of drivers who pay for the service, maintenance and safety of the toll roads.

How will a person be notified that he or she is subject to enforcement remedies?

A notification letter announcing that a person has met the criteria of Habitual Violator is sent to the address in the Texas Department of Motor Vehicles (TTC 372.106) database, allowing 30 days to contact to dispute their determination as a Habitual Violator or address the account balance before remedies are applied. If the Habitual Violator does not make arrangements with the Mobility Authority during this period, they will be subject to all enforcement remedies. Additionally, notification of a registration renewal block is mailed.

Can someone dispute a toll bill?

Yes. You may contact the Mobility Authority to review all outstanding tolls and fees, correct any errors and arrange for payment to clear your status as a Habitual Violator and the block on your registration. Habitual Violators are also given an opportunity to request an administrative hearing with a justice of the peace.

How will I know or be notified that I am subject to a vehicle ban?

Habitual violators subject to vehicle ban will receive notification that they have been banned, including when the ban will take effect and instructions for how to remove their status as a Habitual Violator.

Can I dispute my toll bill that subjects me to the vehicle ban?

Yes. You may contact the Mobility Authority to review all outstanding tolls and administrative fees, correct any errors and arrange for payment to clear your status as a Habitual Violator and remove the vehicle ban.

What happens if I am banned, but get caught driving on a Mobility Authority toll road?

A person commits an offense when operating a vehicle in violation of the ban and is subject to a Class C misdemeanor with a fine up to \$500. A second or subsequent occurrence of driving on the tollway in violation of a ban may result in impoundment of the vehicle.

How will the Mobility Authority know if I'm still driving (after being banned)?

Mobility Authority roads are equipped with technology that recognizes vehicle and license plates on our prohibited list. Individuals operating a prohibited vehicle on Mobility Authority roads will be reported to nearby law enforcement patrolling Mobility Authority roads.

**GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY**

RESOLUTION NO. 22-0XX

**PROHIBITING THE OPERATION OF CERTAIN MOTOR VEHICLES
ON MOBILITY AUTHORITY TOLL FACILITIES PURSUANT TO
THE HABITUAL VIOLATOR PROGRAM**

WHEREAS, Transportation Code, Chapter 372, Subchapter C, authorizes toll project entities, including the Central Texas Regional Mobility Authority (Mobility Authority), to exercise various remedies against certain motorists with unpaid toll violations; and

WHEREAS, Transportation Code §372.106 provides that a “habitual violator” is a registered owner of a vehicle who a toll project entity determines:

(1) was issued at least two written notices of nonpayment that contained:

(A) in the aggregate, 100 or more events of nonpayment within a period of one year, not including events of nonpayment for which: (i) the registered owner has provided to the toll project entity information establishing that the vehicle was subject to a lease at the time of nonpayment, as provided by applicable toll project entity law; or (ii) a defense of theft at the time of the nonpayment has been established as provided by applicable toll project entity law; and

(B) a warning that the failure to pay the amounts specified in the notices may result in the toll project entity’s exercise of habitual violator remedies; and

(2) has not paid in full the total amount due for tolls and administrative fees under those notices; and

WHEREAS, the Mobility Authority previously determined that the individuals listed in Exhibit A are habitual violators, and these determinations are now considered final in accordance with Transportation Code, Chapter 372, Subchapter C; and

WHEREAS, Transportation Code §372.109 provides that a final determination that a person is a habitual violator remains in effect until (1) the total amount due for the person’s tolls and administrative fees is paid; or (2) the toll project entity, in its sole discretion, determines that the amount has been otherwise addressed; and

WHEREAS, Transportation Code §372.110 provides that a toll project entity, by order of its governing body, may prohibit the operation of a motor vehicle on a toll project of the entity if:

(1) the registered owner of the vehicle has been finally determined to be a habitual violator; and

(2) the toll project entity has provided notice of the prohibition order to the registered owner; and

WHEREAS, the Executive Director recommends that the Board prohibit the operation of the motor vehicles listed in Exhibit A on the Mobility Authority's toll roads, including (1) 183A Toll; (2) 290 Toll; (3) 71 Toll; (4) MoPac Express Lanes; (5) 45SW Toll; and (6) 183 Toll.

NOW THEREFORE, BE IT RESOLVED that the motor vehicles listed in Exhibit A are prohibited from operation on the Mobility Authority's toll roads, effective December 14, 2022; and

BE IT FURTHER RESOLVED that the Mobility Authority shall provide notice of this resolution to the individuals listed in Exhibit A, as required by Transportation Code §372.110; and

BE IT IS FURTHER RESOLVED that the prohibition shall remain in effect for the motor vehicles listed in Exhibit A until the respective habitual violator determinations are terminated, as provided by Transportation Code §372.110.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 14th day of December 2022.

Submitted and reviewed by:

Approved:

James M. Bass
Executive Director

Robert W. Jenkins, Jr.
Chairman, Board of Directors

Exhibit A

LIST OF PROHIBITED VEHICLES

(To be provided at the Board Meeting)



CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

December 14, 2022
AGENDA ITEM #4

Approve an Interlocal Agreement
with the Texas Department of
Transportation for the construction of
the Mobility Authority's payment
windows at the TxTag Ridgepoint
Customer Service Center

Strategic Plan Relevance:	Collaboration & Service
Department:	Operations
Contact:	Tracie Brown, Director of Operations
Associated Costs:	\$60,633.98
Funding Source:	Not applicable
Action Requested:	Consider and act on draft resolution

Project Description/Background: To better serve their mutual customers, the Texas Department of Transportation (TxDOT) and the Mobility Authority co-located staff at the TxTag Customer Service Center (CSC) to provide walk-up services to their respective customers. The services allow customers to resolve TxTag and CTRMA toll payments and inquiries in one location. Customers are also able to sign up for tag accounts at the TxTag CSC. The TxTag CSC is open Monday and Friday from 8:00 a.m. – 7:00 p.m. and Tuesday through Thursday from 8:00 a.m. – 5:00 p.m.

Action requested: This proposed Interlocal Agreement (ILA) reimburses TxDOT for the buildout of payment windows at its Ridgepoint CSC. The TxTag Ridgepoint CSC is located at 2420 Ridgepoint Drive, Austin, TX 78754, near 290 and 183. The scope includes buildout of approximately 74.76 walled office space. The space will include tempered glass service windows with two-way speakers, a commercial door with push bar panic device lock, desk areas and a security badge reader.

Walk-up counter service will be available Monday through Friday, 7 a.m. - 7 p.m. and on Saturday from 9 a.m. - 2 p.m. This location will provide a great benefit to the Authority's east and northeast customers, allowing them the opportunity to resolve their CTRMA Pay By Mail bills at no additional cost. This is a particularly advantageous location as the Authority has many unbanked and underbanked customers who will appreciate the opportunity to pay their bills with cash.

The total not to exceed cost for the Ridgepoint payment window buildout is \$60,633.98. This cost is detailed below:

Description	Cost
Standard Office Build Out	\$35,511.00
Two-Way Speaker	\$3,645.32
Security System Readers	\$1,372.00
Post-Build Out Adjustments	\$10,000.00
Total	\$50,528.32
20% Markup from TxDOT Contractor	\$10,105.66
Total Not to Exceed Budget	\$60, 633.98

Staff and equipment are provided by Cofiroute under our agreement for Pay By Mail program support services. TxDOT will allow the staff's co-location at no cost.

Previous Actions & Brief History of the Program/Project: The Mobility Authority Board of Directors approved the execution of an Interlocal Agreement with TxDOT for co-location of staff in July 2020. That ILA expired on August 1, 2022. The Board approved a new ILA for staff co-location at it August 31, 2022 meeting. The new ILA expires in July 2024.

Financing: Not applicable.

Staff Recommendation: Staff recommends approving Interlocal Agreement with the Texas Department of Transportation for the construction of the Mobility Authority's payment windows at the TxTag Ridgepoint Customer Service Center (CSC).

Backup Provided: Draft resolution
Proposed Interlocal Agreement

**GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY**

RESOLUTION NO. 22-0XX

**APPROVING AN INTERLOCAL AGREEMENT WITH
THE TEXAS DEPARTMENT OF TRANSPORTATION FOR OFFICE SPACE BUILDOUT
AT THE TxTAG RIDGEPPOINT CUSTOMER SERVICE CENTER**

WHEREAS, since 2016, the Central Texas Regional Mobility Authority (“Mobility Authority”) and the Texas Department of Transportation (“TxDOT”) have co-located staff at the TxTag Burnet Road Customer Service Center (CSC) to provide walk-up services to their respective customers; and

WHEREAS, by Resolution No. 22-035, dated August 31, 2022, the Board of Directors approved a new interlocal agreement for continued co-location, including flexibility for the services to extend to the TxTAG Ridgepoint CSC; and

WHEREAS, to accommodate the Mobility Authority’s staff at the TxTag Ridgepoint CSC, TxDOT will be incurring costs for the buildout of approximately 74.76 square feet of walled office space that includes a payment window, two-way speakers, a commercial door with push bar panic device lock, desk areas and a security badge reader; and

WHEREAS, in order to reimburse TxDOT for costs incurred for the buildout at the TxTag Ridgepoint CSC, the Executive Director recommends that the Board approve an interlocal agreement with TxDOT in an amount not to exceed \$60, 633.98 and in the form or substantially same form attached hereto as Exhibit A.

NOW THEREFORE, BE IT RESOLVED that the proposed interlocal agreement to reimburse TxDOT for costs incurred for the buildout required to accommodate Mobility Authority staff at the TxTag Ridgepoint CSC is hereby approved; and

BE IT FURTHER RESOLVED that the Executive Director is authorized to finalize and execute the interlocal agreement on behalf of the Mobility Authority in an amount not to exceed \$60, 633.98 and in the form or substantially same form as Exhibit A hereto.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 14th day of December 2022.

Submitted and reviewed by:

Approved:

James M. Bass
Executive Director

Robert W. Jenkins, Jr.
Chairman, Board of Directors

Exhibit A

THE STATE OF TEXAS §
THE COUNTY OF TRAVIS §

INTERLOCAL AGREEMENT

THIS CONTRACT is entered into by the Contracting Parties under Government Code, Chapter 791.

I. CONTRACTING PARTIES:

The Texas Department of Transportation	TxDOT
Central Texas Regional Mobility Authority	Local Government

II. PURPOSE: Reimburse TxDOT for the office space build out at 2420 Ridgepoint Drive, Austin Tx. 78754. TxDOT will share this office space with the Local Government.

III. STATEMENT OF SERVICES TO BE PERFORMED: TxDOT will undertake and carry out services described in **Attachment A**, Scope of Services.

IV. CONTRACT PAYMENT: The total amount of this contract shall not exceed **\$60,633.98** and shall conform to the provisions of **Attachment B**, Budget. Payments shall be billed monthly.

V. TERM OF CONTRACT: This contract begins when fully executed by both parties and terminates on **November 1, 2023**, or when otherwise terminated as provided in this Agreement.

VI. LEGAL AUTHORITY:

THE PARTIES certify that the services provided under this contract are services that are properly within the legal authority of the Contracting Parties.

The governing body, by resolution or ordinance, dated _____, has authorized the Local Government to obtain the services described in **Attachment A**.

This contract incorporates the provisions of **Attachment A**, Scope of Services, **Attachment B**, Budget, **Attachment C**, General Terms and Conditions, **Attachment D**, Resolution or Ordinance and **Attachment E**, Location Map Showing Project.

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

By _____ Date _____
James Bass
Executive Director

FOR THE STATE OF TEXAS

Executed for the Executive Director and approved for the Texas Transportation Commission for the purpose and effect of activating and/or carrying out the orders, established policies or work programs heretofore approved and authorized by the Texas Transportation Commission.

By _____ Date _____
Kenneth Stewart
Director of Contract Services

ATTACHMENT A

Scope of Services

- I. The Local Government shall reimburse TxDOT for all labor, materials and supplies for the office space build out at the Toll Operations Center (TOC) located at 2420 Ridgepoint Drive, Austin Tx. 78754. The 74.76 Sqft walled office space build out will match existing office design and finish. The office space build out will include, but not limited to, the following:
 - Commercial door with push bar panic device locks
 - Tempered glass service windows with two-way speakers
 - Finish and paint
 - Desk areas
 - Additional lighting and electrical outlets
 - Security badge reader
- II. The Local Government shall not make any modifications to the shared office space or place any signage without prior written TxDOT approval. This includes prior, during and after the completion of the build out.
- III. Post-build out adjustments may be requested by TxDOT or the Local Government. Adjustments will be approved by TxDOT.
- IV. Local Government shall have the right to inspect the work and determine it has been performed as agreed prior to making any payment due under this Interlocal Agreement.

ATTACHMENT B

Budget

The Local Government shall reimburse the actual cost to TxDOT for the office space build out which shall not exceed \$60,633.98. TxDOT will invoice the Local Government on a monthly basis as TxDOT is billed for the build out.

The office space build out estimated cost detail is as follows:

Description	Cost
Standard Office Build Out	\$35,511.00
Two-Way Speaker	\$3,645.32
Security System Readers	\$1,372.00
Post-Build Out Adjustments	\$10,000.00
Total	\$50,528.32
20% Markup from TxDOT Contractor	\$10,105.66
Not to Exceed Budget	\$60, 633.98

ATTACHMENT C

General Terms and Conditions

Article 1. Amendments

This contract may only be amended by written agreement executed by both parties before the contract is terminated.

Article 2. Conflicts Between Agreements

If the terms of this contract conflict with the terms of any other contract between the parties, the most recent contract shall prevail.

Article 3. Disputes

TxDOT shall be responsible for the settlement of all contractual and administrative issues arising out of procurements entered in support of contract services.

Article 4. Ownership of Equipment

Except to the extent that a specific provision of this contract states to the contrary, all equipment purchased by TxDOT under this contract shall be owned by TxDOT.

Article 5. Termination

This contract terminates at the end of the contract term, when all services and obligations contained in this contract have been satisfactorily completed, by mutual written agreement, or 30 days after either party gives notice to the other party, whichever occurs first.

Article 6. Gratuities

Any person who is doing business with or who reasonably speaking may do business with TxDOT under this contract may not make any offer of benefits, gifts, or favors to employees of TxDOT.

Article 7. Responsibilities of the Parties

Each party acknowledges that it is not an agent, servant, or employee of the other party. Each party is responsible for its own acts and deeds and for those of its agents, servants, or employees.

Article 8. Compliance with Laws

The parties shall comply with all federal, state, and local laws, statutes, ordinances, rules, and regulations and with the orders and decrees of any courts or administrative bodies or tribunals in any manner affecting the performance of this agreement.

Article 9. State Auditor's Provision

The state auditor may conduct an audit or investigation of any entity receiving funds from TxDOT directly under the contract or indirectly through a subcontract under the contract. Acceptance of funds directly under the contract or indirectly through a subcontract under this contract acts as acceptance of the authority of the state auditor, under the direction of the legislative audit committee, to conduct an audit or investigation in connection with those funds. An entity that is the subject of an audit or investigation must provide the state auditor with access to any information the state auditor considers relevant to the investigation or audit.

Article 10. Signatory Warranty

Each signatory warrants that the signatory has necessary authority to execute this agreement on behalf of the entity represented.

Article 11. Notices

All notices to either party shall be delivered personally or sent by certified U.S. mail, postage prepaid, addressed to that party at the following address:

Local Government:	Central Texas Regional Mobility Authority Director of Operations 3300 North Interstate 35 Suite #300 Austin, Texas 78705
TxDOT:	Texas Department of Transportation Director of Contract Services 125 East 11th Street Austin, Texas 78701

All notices shall be deemed given on the date delivered in person or deposited in the mail. Either party may change the above address by sending written notice of the change to the other party. Either party may request in writing that notices shall be delivered personally or by certified U.S. mail, and that request shall be carried out by the other party.

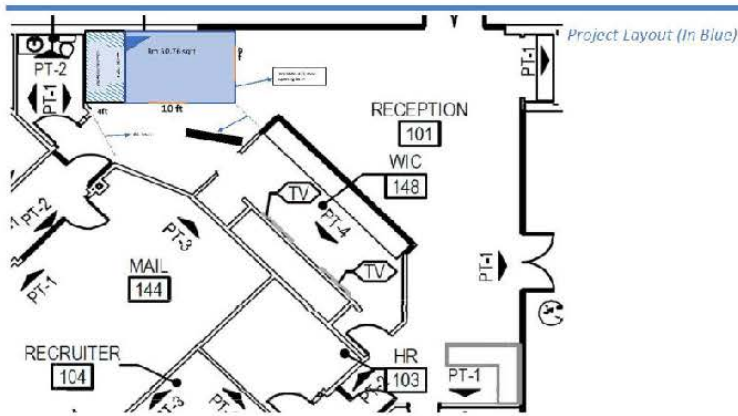
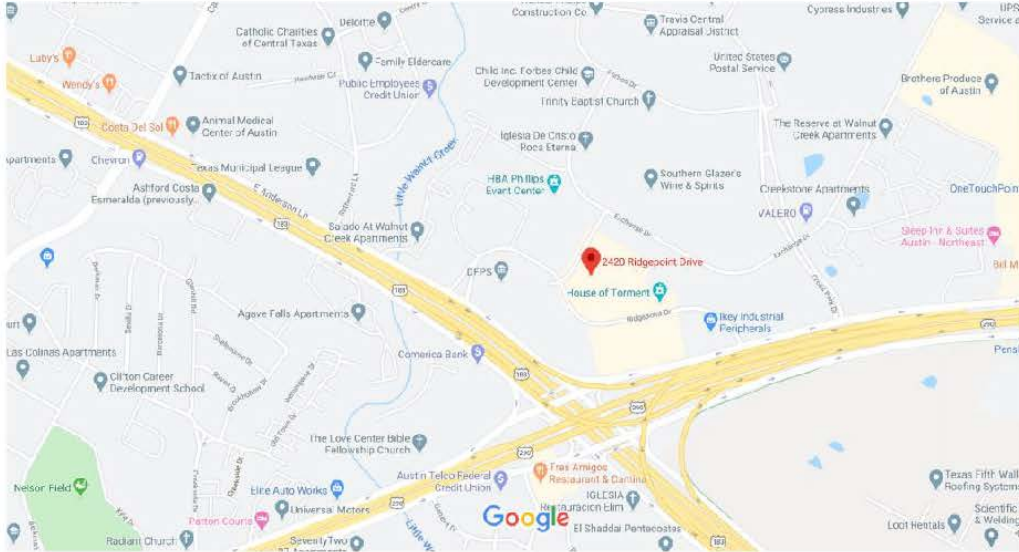
ATTACHMENT D
Resolution or Ordinance

ATTACHMENT E

Location Maps Showing Project

Google Maps

2420 Ridgepoint Dr
TOD-TOC





CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

December 14, 2022
AGENDA ITEM #5

Approve the annual compliance report for submittal to the Texas Department of Transportation as required by 43 Texas Administrative Code §26.65

Strategic Plan Relevance: Stewardship
Department: Finance
Contact: José Hernández, Chief Financial Officer
Associated Costs: N/A
Funding Source: N/A
Action Requested: Consider and act on draft resolution

Project Description/Background: Pursuant to 43 Texas Administrative Code §26.65, the Mobility Authority is required to submit a report to TxDOT confirming that the Mobility Authority has complied with all the responsibilities it is required to perform under Texas Administrative Code, Title 43, Chapter 26, Subchapter G. The compliance report must be in the form prescribed by TxDOT, approved by official action of the Board of Directors, and certified as correct by the Executive Director.

Previous Actions & Brief History of the Program/Project: N/A

Financing: N/A

Action requested/Staff Recommendation: Staff recommends approving the attached resolution.

Backup Provided: Draft Resolution
Compliance Report

**GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY**

RESOLUTION NO. 22-0XX

**APPROVING THE ANNUAL COMPLIANCE REPORT FOR
SUBMITTAL TO THE TEXAS DEPARTMENT OF TRANSPORTATION**

WHEREAS, the Texas Transportation Commission has adopted rules codified at Title 43, Chapter 26, Subchapter G of the Texas Administrative Code (TAC) that require regional mobility authorities to file certain reports and conduct certain audits, as specified therein; and

WHEREAS, pursuant to 43 TAC § 26.65(a), the Central Texas Regional Mobility Authority (Mobility Authority) is required to file a report with the Texas Department of Transportation (TxDOT) confirming that the Mobility Authority has complied with all the duties it is required to perform under Title 43, Chapter 26, Subchapter G of the Texas Administrative Code; and

WHEREAS, the Executive Director has prepared a compliance report containing the information in the form required by 43 TAC § 26.65(a) which is attached hereto as Exhibit A; and

WHEREAS, the compliance report must be approved by the Board prior to submission to TxDOT; and

WHEREAS, the Executive Director certifies to the Board that the information contained in the compliance report attached hereto as Exhibit A is true and correct.

NOW THEREFORE, BE IT RESOLVED, that the Board hereby approves the compliance report in the form attached hereto as Exhibit A; and

BE IT FURTHER RESOLVED, that the Board directs the Executive Director to perform all actions necessary to submit the compliance report to the Texas Department of Transportation in accordance with 43 TAC § 26.65(a).

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 14th day of December 2022.

Submitted and reviewed by:

Approved:

James M. Bass
Executive Director

Robert W. Jenkins, Jr.
Chairman, Board of Directors

Exhibit A

Central Texas Regional Mobility Authority Compliance Report

Texas Administrative Code Title 43, Part I, Chapter 26, Subchapter G
§26.65(a) Annual Reports to the Commission

Compliance Rule	Compliance Statement	Certification
<i>Rule §26.61 Written Reports:</i>		
The annual operating and capital budgets adopted by the RMA year.	The Mobility Authority submits copies of the annual operating and capital budget adopted for the Fiscal Year 2023 beginning July 1, 2022, to Travis County and Williamson County.	The Board of Directors approved the FY 2023 Budget by Resolution No. 22-027 enacted on June 29, 2022.
Any annual financial information and notices of material events required to be disclosed under Rule 15c2-12 of the SEC.	No financial information or notices are required to be disclosed; not applicable.	
To the extent not disclosed in another report required in this compliance report, a statement of any surplus revenue held by the RMA and a summary of how it intends to use the surplus revenue.	The Mobility Authority did not hold any "surplus revenue" in FY 2022, as that term is defined by §370.003(12) of the Transportation Code.	
An independent auditor's review of the reports of investment transactions prepared under Government Code, §2256.023.	Included as part of the FY 2022 annual audit. See certification below.	Included as part of the FY 2022 annual audit. See certification below.
<i>Rule §26.62 Annual Audit:</i>		
The RMA shall maintain its books and records in accordance with generally accepted accounting principles in the United States and shall have an annual financial and compliance audit of such books and records.	The Mobility Authority received an unmodified opinion for FY 2022 from an independent certified public accountant.	The FY 2022 annual audit was accepted by the Board of Directors (acting through its Audit Committee) by resolution 22-046 enacted October 26, 2022.
The annual audit shall be submitted to each county or city that is a part of the RMA within 120 days after the end of the fiscal year and conducted by an independent certified public accountant.	The Mobility Authority submitted electronic copies of the FY 2022 annual audit to Travis County and Williamson County.	The Mobility Authority provided to Travis County and Williamson County an electronic copy of the FY 2022 audit accepted by resolution on November 1, 2022.
All work papers and reports shall be retained for a minimum of four years from the date of the audit.	Work papers and reports are and will be retained for a minimum of four years.	

<i>Rule §26.63 Other Reports to Counties and Cities:</i>		
Provide other reports and information regarding its activities promptly when requested by the counties or cities.	The Mobility Authority promptly provides reports and information regarding its activities when requested by Travis County or Williamson County. There is no city that is a part of the Central Texas Regional Mobility Authority.	
<i>Rule §26.64 Operating Records:</i>		
The Department will have access to all operating and financial records of the RMA. The executive director will provide notification if access is desired by the department.	The Mobility Authority will provide the Texas Department of Transportation access to all its operating and financial records when requested by the Department's executive director.	



CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

December 14, 2022 AGENDA ITEM #6

Approve a contract with Aaron
Concrete Contractors, LP for 290E
Retaining Wall Stabilization
Maintenance Project

Strategic Plan Relevance:	Regional Mobility
Department:	Engineering
Contact:	Mike Sexton, P.E., Acting Director of Engineering
Associated Costs:	\$976,128.00
Funding Source:	FY23 Operating Budget R&R Funds
Action Requested:	Consider and act on draft resolution

Project Description/Background: The 290E Wall Stabilization Maintenance Project includes the installation of prestressed ground anchors to stabilize the retaining wall on the southeast corner of Harris Branch Parkway and 290E Toll intersection. In March of 2022 the retaining wall was instrumented with monitoring equipment to track the movement of the wall. Based on the wall monitoring data, the project began design in September of 2022 as a part of the Authority's maintenance program. The construction of this project will stabilize the retaining wall and prevent further movement.

Previous Actions & Brief History of the Program/Project: In June of 2022 the Authority approved the adoption of the FY2023 Operating Budget which included funds for the development and construction of wall improvements along 290E.

Construction Contract Procurement Timeline:

- November 11th, 2022: Advertised Project
- November 15th, 2022: Pre-Bid Meeting
- December 7th, 2022: Bid Opening

Bids: 2 bids were received and came in as shown below.

Contractor	Bid Price	Responsive Bid
Aaron Concrete Contractors, LP	\$ 976,128.00	Yes
Dan Williams Company	\$ 1,169,197.00	Yes

The Engineer's Estimate was \$725,369.00

The bid has been reviewed by the Authority staff and the lowest responsive and responsible bidder is Aaron Concrete Contractors, LP at \$976,128.00

Financing: FY23 Operating Budget R&R Funds

Action requested/Staff Recommendation: Staff recommends that the Board award the contract for construction of the 290E Wall Stabilization Maintenance Project to Aaron Concrete Contractors, LP and authorize the Executive Director to execute a contract with Aaron Concrete Contractors, LP in an amount not to exceed \$976,128.00 for construction of the 290E Wall Stabilization Maintenance Project.

Backup provided: Draft Resolution
Draft Contract

**GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY**

RESOLUTION NO. 22-0XX

**AWARDING A CONTRACT TO AARON CONCRETE CONTRACTORS, LP FOR THE
290E RETAINING WALL STABILIZATION MAINTENANCE PROJECT**

WHEREAS, the Central Texas Regional Mobility Authority (Mobility Authority) requires the services of a contractor to stabilize the retaining wall on the southeast corner of Harris Branch Parkway and 290E Toll intersection in Travis County, Texas (the “Project”); and

WHEREAS, the Mobility Authority advertised the Project on November 11, 2022, and received two bids by the bid opening on December 7, 2022; and

WHEREAS the Acting Director of Engineering reviewed the bids and determined Aaron Concrete Contractors, LP to be the lowest responsive and responsible bidder; and

WHEREAS, after reviewing the Acting Director of Engineering’s determination, the Executive Director requests that the Board approve a contract with Aaron Concrete Contractors, LP for the Project in an amount not to exceed \$976,128.00 and in the form published in the bid documents attached hereto as Exhibit A.

NOW, THEREFORE, BE IT RESOLVED, that the Board hereby approves a contract with Aaron Concrete Contractors, LP in an amount not to exceed \$976,128.00 for the stabilization of the retaining wall on the southeast corner of Harris Branch Parkway and 290E Toll intersection in Travis County, and hereby authorizes the Executive Director to finalize and execute the contract in the form or substantially same form published in the bid documents attached hereto as Exhibit A.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 14th day of December 2022.

Submitted and reviewed by:

Approved:

James M. Bass
Executive Director

Robert W. Jenkins, Jr.
Chairman, Board of Directors

Exhibit A



CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

290E Wall Stabilization Project

CTRMA Contract No.: 23290E22701M

Bid Documents

Advertisement: November 11, 2022

Pre-Qualification Deadline: 12:00PM November 29, 2022

Bid Date: 2:00 PM December 7, 2022

Central Texas Regional Mobility Authority

290E WALL STABILIZATION PROJECT

CTRMA CONTRACT NO. 23290E22701M

BID DOCUMENTS
CONTRACT AND CONTRACT BOND
SPECIAL PROVISIONS
SPECIAL SPECIFICATIONS
PLANS

November 11, 2022

Central Texas Regional Mobility Authority

290E WALL STABILIZATION PROJECT

CTRMA CONTRACT NO. 23290E22701M

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CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

290E WALL STABILIZATION PROJECT

CTRMA CONTRACT NO. 23290E22701M

INVITATION TO BID

Electronic proposal forms for the above project shall be submitted via the project's CivCast <https://www.civcastusa.com/project/633c520456e215eccc67896d/summary> to the Central Texas Regional Mobility Authority (Authority), by **2:00 PM local time, December 7, 2022**. The bids will be publicly posted via the project's CivCast website within 48 hours after the bids are opened.

The contractor will have forty-seven (47) working days after the date stated in the written Full Notice to Proceed to achieve full completion of all work. The Authority reserves the right to make changes in the work to complete the contract, as defined in the specifications.

The complete list of quantities is located in the Bid Form. The principal items of work are as follows:

- Prestressed Ground Anchors
- Excavation/Embankment
- Traffic Control
- Temporary Retaining Wall

The Official Bid Form for this Contract will be made available to prospective bidders who have met all prequalification requirements on or before 5:00 PM local time, on November 30, 2022 via the project's CivCastUSA website <https://www.civcastusa.com/project/633c520456e215eccc67896d/summary>.

Prequalification requirements:

- Be registered with State of Texas,
- Be fully prequalified by Texas Department of Transportation (TxDOT),
- Have a bidding capacity per TxDOT prequalification system of \$1,000,000
- Submit a valid Non-Collusion Affidavit, Debarment Affidavit, and Child Support Statement,

The deadline for meeting the prequalification requirements and still obtaining an Official Bid Form is November 29, 2022 at Noon.

The Authority cannot be held liable in the event a party is unable to submit a valid bid due to delay in the prequalification procedure. Securing prequalification through TxDOT and the timing thereof, shall at all times be the sole responsibility of the Prospective Bidder.

Complete Contract documents will be available on November 11, 2022 for potential bidders and others through the Authority's website (www.mobilityauthority.com) and CivCast's website <https://www.civcastusa.com/project/633c520456e215eccc67896d/summary>.

Standard Specifications (Texas Department of Transportation "Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges", November 1, 2014) which form an integral part of this Contract, are available on line at the Texas Department of Transportation (TxDOT) website (<https://www.txdot.gov/business/resources/txdot-specifications.html>).

The contract will be awarded in accordance with the Authority's Procurement policy. A copy of the Procurement Policy is available online at the Authority website: (<https://www.mobilityauthority.com/about/policy-disclaimers/code>).

For more information, please submit a question to the project team through CivCast.com.

Each bid must be accompanied by a Bid Guaranty consisting of a Bid Bond (on the form provided) in the amount of at least five percent (5%) of the Total Bid Amount. The apparent low bidder shall deliver the original sealed Bid Bond to CTRMA within five (5) calendar days of such notification.

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
James Bass, Executive Director
Austin, Texas

Central Texas Regional Mobility Authority

290E WALL STABILIZATION PROJECT

CTRMA CONTRACT NO. 23290E22701M

BID DOCUMENT CHECKLIST

Prior to submitting a bid, prospective bidders should review the checklist below to ensure that the bid is accepted and not declared nonresponsive. No joint venture participants will be allowed.

Bid Document:

- Are you aware if your affiliates are bidding on the same project?
- Are you pre-qualified by TxDOT through the Confidential Questionnaire process and have a bidding capacity of \$1,000,000.
- Have you submitted a valid Non-Collusion Affidavit, Debarment Affidavit, and Child Support Statement in order to receive an Official Bid Form?

Bid Document Preparation:

- Is the bid being submitted on the Official Bid Form via the CivCast website?
- Are you submitting only one bid for this project?
- Is the bid signed by your company representative or each joint venture participant?
- Have you entered prices for all bid items?
- Does the bid document contain all items included in the Official Bid Form?
- Does the bid document contain a total bid value?
- Is the bid free of any additional conditions not included in the bid document provided to you?
- Have you electronically submitted a complete and executed Bid Bond?
- Have you acknowledged each Addendum on CivCast?

Bid Bonds:

- Is the bid bond signed by the surety?
- Is the bid bond signed by the company representative?
- Is the exact name of the contractor(s) listed as the principal?
- Is the impressed surety seal affixed to the bid bond?
- Does the name on the surety seal match the name of the surety on the bond?
- Is the bond dated on or earlier than the letting date of the project?
- Is the signer for the surety listed on the power of attorney attached to the bond?
- Is the surety authorized to issue the bond?

Bid Document Submission:

- Are you aware of the time and date deadline for submission for the bid document?
- Are you submitting a complete bid document?

Central Texas Regional Mobility Authority

290E WALL STABILIZATION PROJECT

CTRMA CONTRACT NO. 23290E22701M

290E WALL STABILIZATION PROJECT MAINTENANCE CONTRACT

To the Central Texas Regional Authority
3300 N I-35, Suite 300
Austin, Texas 78705

Gentlemen:

I/we, the undersigned, declare: that no other person, firm or corporation is interested in this Bid; that I/we have carefully examined the Plans, Standard Specifications, Special Provisions, and all other documents pertaining to this Contract which form a part of this Bid as if set forth at length herein; that I/we understand that the quantities of items shown herein below are approximate only; that I/we have examined the location of the proposed work; that I/we agree to bind myself/ourselves, upon award to me/us by the Central Texas Regional Authority under this Bid, to enter into and execute a Contract, for the project named above; that I/we agree to start work within thirty (30) calendar days after the date stated in the written Notice-to-Proceed (Item 8.1 of the Specifications), to furnish all necessary materials, provide all necessary labor, equipment, tools and plant, pay for all required insurance, bonds, permits, fees and service, and do all required work in strict compliance with the terms of all documents comprising said Contract, and to fully complete the entire project within forty-seven (47) working days after Notice-to-Proceed; and that I/we agree to accept as full compensation for the satisfactory prosecution of this project the contractual bid amount after it is adjusted based on the terms and conditions specified in the contract.

The quantities shown in the above schedule of items are considered to be approximate only and are given as the basis for comparison of bids. The Authority may increase or decrease the amount of any item or portion of the work as may be deemed necessary or expedient. Any increase or decrease in the amount of any item or portion of work will be added or deducted from the total Contract bid price based on the terms and conditions specified in TxDOT Specification Item 4. It is understood that payment for this project will be by unit prices bid.

The cost of any work performed, materials furnished, services provided, or expenses incurred, whether or not specifically delineated in the Contract documents but which are incidental to the scope and plans, intent, and completion of this Contract, have been included in the price bid for the various items scheduled hereinabove.

Accompanying this Bid is a bid guaranty consisting of a Bid Bond (on the form provided) in the amount of at least five percent (5%) of the Official Total Bid Amount. It is hereby understood and agreed that said Bid Bond is to be forfeited as liquidated damages in the event that, on the basis of this Bid, the Authority should award this Contract to me/us and that I/we should fail to execute and deliver said Contract and the prescribed Contract Bond, together with the proof of proper insurance coverage and other necessary documents, all within fifteen (15) calendar days after award of the Contract; otherwise, said check or bond is to be returned to the undersigned.

Business Name of Bidder _____

Type of Organization Individual
 Partnership
 Corporation

Address of Bidder: _____

Signature of Owner,
Partner or Corp. Officer: _____

Title: _____

Date: _____

Central Texas Regional Mobility Authority

290E WALL STABILIZATION PROJECTS

CTRMA CONTRACT NO. 23290E22701M

NON-COLLUSION AFFIDAVIT

STATE OF _____)

COUNTY OF _____)

I, _____, of the
City of _____, County of _____ and State of
_____, being of full age and duly sworn according to law on my oath
depose and say:

That I am _____ (Title) of
_____, the Bidder making
the Bid submitted to the Central Texas Regional Mobility Authority, on the 7th day of December,
2022, for Contract No. 23290E22701M in connection with the 290E Wall Stabilization Project;
that I executed the said Bid with full authority to do so;

The said Bidder has not, directly or indirectly, entered into any combination or
arrangement with any person, firm or corporation or entered into any agreement, participated in
any collusion, or otherwise taken any action in restraint of free, competitive bidding or which
would increase the cost of construction or maintenance in connection with the said Contract; that
no person or selling agency has been employed or retained to solicit or secure the said Contract
upon an agreement or understanding for a commission, percentage, brokerage or contingent fee,
except bona fide full-time employees;

And that said Bidder is or has been a member of the following highway contractors' association during the preceding twelve months:

Name of Association	Location of Principal Office
_____	_____
_____	_____
_____	_____

I further warrant that all statements contained in said Bid and in this Affidavit are true and correct and made with full knowledge that the said Authority relies upon the truth of the statements contained in said Bid and in this Affidavit in awarding the said Contract.

Sworn to and subscribed
before me this _____
day of _____,
20__.

By: _____
Person Signing Bid

Print Name: _____
Title: _____

Notary Public

My commission expires: _____

Central Texas Regional Mobility Authority

290E WALL STABILIZATION PROJECT

CTRMA CONTRACT NO. 23290E22701M

DEBARMENT AFFIDAVIT

STATE OF _____)

COUNTY OF _____)

I, _____, of the City
of _____, County of _____ and State of
_____, being of full age and duly sworn according to law on my oath
depose and say:

That I am _____(Title) of
_____, the Bidder making
the Bid submitted to the Central Texas Regional Mobility Authority, on the 7th day of December,
2022, for Contract No. 23290E22701M in connection with the 290E Wall Stabilization Project;
that I executed the said Bid with full authority to do so;

The said Bidder has not been excluded or disqualified from doing business on State or
Federal projects;

And that said Bidder is or has been a member of the following highway contractors'
association during the preceding twelve months:

Name of Association	Location of Principal Office
_____	_____
_____	_____
_____	_____

I further warrant that all statements contained in said Bid and in this Affidavit are true and correct and made with full knowledge that the said Authority relies upon the truth of the statements contained in said Bid and in this Affidavit in awarding the said Contract.

Sworn to and subscribed
before me this _____
day of _____,
20__.

By: _____
Person Signing Bid

Print Name: _____
Title: _____

Notary Public

My commission expires: _____

CHILD SUPPORT STATEMENT

Under section 231.006, Family Code, the vendor or applicant certifies that the individual or business entities named in this contract, bid, or application is not ineligible to receive the specified grant, loan, or payment and acknowledges that this contract may be terminated, and payment may be withheld if this certification is inaccurate.



CHILD SUPPORT STATEMENT FOR NEGOTIATED CONTRACTS AND GRANTS

Under Family Code, Section 231.006, _____
 Certifies that _____,
 as of _____ is eligible to receive a grant, loan or payment and acknowledges
 that any contract may be terminated and payment may be withheld if this certification is inaccurate.

List below the name and social security number of the individual or sole proprietor and each partner, shareholder, or owner with an ownership interest of at least 25% of the business entity submitting the bid or application. This form must be updated whenever any party obtains a 25% ownership interest in the business entity.

NAME <i>(please print legibly, if handwritten)</i>	SOCIAL SECURITY NUMBER

Family Code, Section 231.006, specifies that a child support obligor who is more than thirty (30) days delinquent in paying child support and a business entity in which the obligor is a sole proprietor, partner, shareholder, or owner with an ownership interest of at least 25% is not eligible to receive payments from state funds under a contract to provide property, materials, or services; or receive a state-funded grant or loan.

A child support obligor or business entity ineligible to receive payments described above remains ineligible until all arrearage have been paid or the obligor is in compliance with a written repayment agreement or court order as to any existing delinquency.

Except as provided in Family Code, Section 231.302(d), a social security number is confidential and may be disclosed only for the purposes of responding to a request for information from an agency operating under the provisions of Subchapters A and D of Title IV of the federal Social Security Act (42 U.S.C. Sections 601 et seq. and 651 et seq.)

CERTIFICATION TO NOT BOYCOTT ISRAEL

Pursuant to Texas Government Code 2271.002, the Mobility Authority must include a provision requiring a written verification that the Contractor does not boycott Israel and will not boycott Israel during the term of the Contract. By signing the contract, the Contractor certifies that it does not boycott Israel and will not boycott Israel during the term of this contract.

Violation of this certification may result in action by the Mobility Authority.

**CERTIFICATION TO NOT DISCRIMINATE AGAINST
FIREARM ENTITIES OR FIREARM TRADE ASSOCIATIONS**

Pursuant to Texas Government Code 2274.002, the Department must include a provision requiring a written verification affirming that the Contractor:

- 1) does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association, as defined in Government Code 2274.001, and
- 2) will not discriminate against a firearm entity or firearm trade association during the term of the contract.

This provision applies to a contract that:

- 1) is with a Contractor that is not a sole proprietorship,
- 2) is with a Contractor with 10 or more full-time employees, and
- 3) has a value of \$100,000 or more.

By signing, the Contractor certifies that it does not discriminate against a firearm entity or firearm trade association as described and will not do so during the term of this contract.

"Discriminate against a firearm entity or firearm trade association" means, with respect to the entity or association, to: (1) refuse to engage in the trade of any goods or services with the entity or association based solely on its status as a firearm entity or firearm trade association; (2) refrain from continuing an existing business relationship with the entity or association based solely on its status as a firearm entity or firearm trade association; or (3) terminate an existing business relationship with the entity or association based solely on its status as a firearm entity or firearm trade association. "Discriminate against a firearm entity or firearm trade association" does not include: (1) the established policies of a merchant, retail seller, or platform that restrict or prohibit the listing or selling of ammunition, firearms, or firearm accessories; (2) a company's refusal to engage in the trade of any goods or services, decision to refrain from continuing an existing business relationship, or decision to terminate an existing business relationship to comply with federal, state, or local law, policy, or regulations or a directive by a regulatory agency, or for any traditional business reason that is specific to the customer or potential customer and not based solely on an entity's or association's status as a firearm entity or firearm trade association.

Violation of this certification may result in action by the Department.

CERTIFICATION TO NOT BOYCOTT ENERGY COMPANIES

Pursuant to Texas Government Code 2274.002, the Department must include a provision requiring a written verification affirming that the Contractor does not boycott energy companies, as defined in Government Code 809.001, and will not boycott energy companies during the term of the contract. This provision applies to a contract that:

- 1) is with a Contractor that is not a sole proprietorship,
- 2) is with a Contractor with 10 or more full-time employees, and
- 3) has a value of \$100,000 or more.

By signing, the Contractor certifies that it does not boycott energy companies and will not boycott energy companies during the term of this contract. “Boycott” means taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations with a company because the company: (1) engages in the exploration, production, utilization, transportation, sale, or manufacturing of fossil fuel-based energy and does not commit or pledge to meet environmental standards beyond applicable federal and state law; or (2) does business with a company described by (1).

Violation of this certification may result in action by the Department.

Central Texas Regional Mobility Authority

290E WALL STABILIZATION PROJECT

CTRMA CONTRACT NO. 23290E22701M

BID BOND

KNOW ALL PERSONS MEN BY THESE PRESENTS,
that _____, as Principal/Contractor, and
_____, as Surety, legally authorized to do
business in the State of Texas, are held and firmly bounded unto the Central Texas Regional
Mobility Authority, as Authority, in the amount of at least five percent (5%) percent of the Total
Bid amount, on which the Contract is awarded lawful money of the United States of America, for
the payment of which, well and truly to be made, we bind ourselves, our heirs, executors,
administrators, successors and assigns, jointly and severally and firmly by these presents:

WHEREAS, the Contractor is herewith submitting its Bid for Contract No.
23290E22701M, entitled 290E Wall Stabilization Project, and

NOW, THEREFORE, the condition of this obligation is such, that if the Contractor shall be
awarded the Contract upon said Bid and shall, within fifteen (15) calendar days after the date of
written notice of such award, enter into and deliver a signed Contract and the prescribed
Performance Bond for the faithful performance of the Contract, together with the required proof of
proper insurance coverage and other necessary documents, then this obligation shall be null and
void; otherwise, to remain in full force and effect, and the Contractor and Surety will pay unto the
Authority the difference in money between the amount of the Total Amount written in the Bid of
said Contractor and the amount for which the Authority may legally contract with another party to
perform the said work, if the latter amount be in excess of the former; but in no event shall the
Surety's liability exceed the penal sum hereof.

SIGNED AND SEALED this _____ day of _____, 20____.

PRINCIPAL/CONTRACTOR

Business Name

Address

Witness or Attest:

By: _____

Title:

(Affix Corporate Seal Here)

SURETY:

Business Name

Address

Witness or Attest:

By: _____

Title:

(Attach evidence of Power of Attorney)

(Affix Corporate Seal Here)

Central Texas Regional Mobility Authority

290E WALL STABILIZATION PROJECT

CTRMA CONTRACT NO. 23290E22701M

CONTRACT AGREEMENT

THIS AGREEMENT, made this ____ day of _____, 20__, between the Central Texas Regional Mobility Authority, 3300 N. I-35, Suite 300, Austin, Texas, 78705, hereinafter called the "Authority" and _____, or his, its or their successors, executors, administrators and assigns, hereinafter called the Contractor.

WITNESSETH, that the Contractor agrees with the Authority for the consideration herein mentioned, and at his, its or their own proper cost and expense, to do all the work and furnish all the materials, equipment, teams and labor necessary to prosecute and complete and to extinguish all liens therefore, Contract No. 23290E22701M, entitled 290E Wall Stabilization Project, in the manner and to the full extent as set forth in the Plans, Standard Specifications, Special Provisions, Bid (for the basis of award stated herein below) and other documents related to said Contract which are on file at the office of the Authority and which are hereby adopted and made part of this Agreement as completely as if incorporated herein, and to the satisfaction of the Authority or its duly authorized representative who shall have at all times full opportunity to inspect the materials to be furnished and the work to be done under this Agreement.

This Contract is awarded on the basis of the official total Bid Amount based on the unit prices bid of _____ dollars and _____ Cents (\$ _____).

In consideration of the foregoing premise, the Authority agrees to pay the Contractor for all items of work performed and materials furnished at the amount of the unit prices bid therefore in the Bid submitted for this Contract, subject to any percentage reductions in the total Contract amount that may be named in the Bid corresponding to the basis of award stated in the above paragraph, and subject to the conditions set forth in the Specifications.

The Contractor agrees as follows:

- a. I/WE will not discriminate against any employee or applicant for employment because of race, religion, color, sex or national origin, except where religion, sex or national origin is a bona fide occupational qualification reasonably necessary to the normal operation of the Contractor.

- b. I/WE agree it is the policy of the Company to assure that applicants are employed, and that employees are treated during employment, without regard to their race, religion, sex, color or national origin, age or disability. Such action shall include: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship, pre-apprenticeship, and on-the-job training.
- c. I/WE agree to post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause.
- d. I/WE in any solicitations or advertising for employees placed by or on behalf of itself, will state that it is an equal opportunity employer.
- e. I/WE agree to adhere to all federal/state regulations including, but not limited to, American Disabilities Act, Equal Employment Opportunity, submitting certified payrolls, and participating in Contractor/Subcontractor labor standard reviews.
- f. Notices and advertisements and solicitations placed in accordance with applicable state and federal law, rule or regulation, shall be deemed sufficient for the purposes of meeting the requirements of this section.
- g. Contract Time - The contractor will have forty-seven (47) working days after the date stated in the written Full Notice-to-Proceed to Fully complete the project.
- h. Failure by Contractor to fulfill these requirements is a material breach of the Contract, which may result in the termination of this Contract, or such other remedy, as the Authority deems appropriate.

IN WITNESS WHEREOF, the parties hereto have duly executed this Agreement the day and year written above.

Sworn to and Subscribed

CENTRAL TEXAS REGIONAL MOBILITY
AUTHORITY

before me this _____
day of _____, 20__.

By: _____

James Bass
Executive Director

Notary Public

My commission expires:

CONTRACTOR:

Business Name

Address

Sworn to and subscribed
before me this _____
day of _____, 20____.

by: _____
Notary Public

Title

My commission expires:

(Affix Corporate Seal Here)

INFORMATION ABOUT PROPOSER ORGANIZATION

Proposer's business address:

(No.) (Street) (Floor or Suite)

(City) (State or Providence) (ZIP or Postal Code) (Country)

State or County of Incorporation/Formation/Organization: _____

Signature block for a corporation or limited liability company:

Company: _____

By: _____

Printed Name: _____

Title: _____

Additional Requirements:

- A. If the proposer is a corporation, enter state or country of incorporation in addition to the business address. If the proposer is a partnership, enter state or country of formation. If the proposer is a limited liability company, enter state or country of organization.
- B. Describe in detail the legal structure of the entity making the Bid. If the proposer is a partnership, attach full name and addresses of all partners and the equity ownership interest of each entity, provide the aforementioned incorporation, formation and organization information for each general partner and attach a letter from each general partner stating that the respective partner agrees to be held jointly and severally liable for any and all of the duties and obligations of the proposer under the Bid and under any contract arising therefrom. If the proposer is a limited liability entity, attach full names and addresses of all equity holders and other financially responsible entities and the equity ownership interest of each entity. If the proposer is a limited liability company, include an incumbency certificate executed by a Secretary thereof in the form set on the following page listing each officer with signing authority and its corresponding office. Attach evidence to the Bid and to each letter that the person signing has authority to do so.
- C. With respect to authorization of execution and delivery of the Bid and the Agreements and validity thereof, if any signature is provided pursuant to a power of attorney, a copy of the power of attorney shall be provided as well as a certified copy of corporate or other appropriate resolutions authorizing said power of attorney. If the Proposer is a corporation, it shall provide evidence of corporate authorization in the form of a resolution of its governing body certified by an appropriate officer of the corporation. If the Proposer is a limited liability company, evidence of authorization would be in the form of a limited company resolution and a managing member resolution providing such authorization, certified by an appropriate officer of the managing member. If the Proposer is a partnership, evidence of authorization shall be provided for the governing body of the Proposer and for the governing bodies of each of its general partners, at all tiers, and in all cases certified by an appropriate officer.
- D. The Proposer must also identify those persons authorized to enter discussions on its behalf with the Authority in connection with this Bid, the Project, and The Agreement. The Proposer shall submit with its Bid a power of attorney executed by the Proposer and each member, partner of the Proposer, appointing and designating one or more individuals to act for and bind the Proposer in all matters relating to the Bid.

INCUMBENCY CERTIFICATE

The undersigned hereby certifies to the Central Texas Regional Mobility Authority that he/she is the duly elected and acting _____ Secretary of _____ (the "Company"), and that, as such, he/she is authorized to execute this Incumbency Certificate on behalf of the Company, and further certifies that the persons named below are duly elected, qualified and acting officers of the Company, holding on the date hereof the offices set forth opposite their names.

NAME:

OFFICE:

IN WITNESS WHEREOF, the undersigned has executed this Incumbency Certificate this _____ day of _____.

Secretary

Central Texas Regional Mobility Authority

290E WALL STABILIZATION PROJECT

CTRMA CONTRACT NO. 23290E22701M

PERFORMANCE BOND

STATE OF TEXAS
COUNTY OF _____

KNOW ALL MEN BY THESE PRESENTS: That _____

_____ of the City of _____

County of _____, and State of _____, as principal,
and

_____ authorized under the laws of the State of Texas to act as surety on bonds for principals, are held and firmly bound unto the Central Texas Regional Mobility Authority (Authority), in the penal sum of

_____ Dollars

(\$ _____) for the payment whereof, the said Principal and Surety bind themselves, their heirs, administrators, executors, successors, jointly and severally, by these presents:

WHEREAS, the Principal has entered into a certain written contract with the Authority, dated the _____ day of _____, 20__ (the "Contract"), to which the said Contract, along with the Contract Documents referenced therein are hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall faithfully perform said Agreement and shall in all respects duly and faithfully observe and perform all and singular the covenants, conditions and agreements in and by the Contract agreed and covenanted by the Principal to be observed and performed, and according to the true intent and meaning of said Contract and the Contract Documents hereto annexed, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions of Chapter 2253 of the Texas Government Code, as amended and all liabilities on this bond shall be determined in accordance with the provisions of said Chapter to the same extent as if it were copied at length herein.

SURETY, for value received, stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Agreement or to the work performed thereunder, or to the Contract Documents referenced therein, shall in anyway affect the obligations on this bond, and it does hereby waive notice of such change, extension of time, alteration or addition to the terms on the Agreement, or to the work to be performed thereunder.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20__.

PRINCIPAL

SURETY

SIGNATURE

SIGNATURE

NAME & TITLE

NAME & TITLE

ADDRESS

ADDRESS

(_____) _____
PHONE NUMBER

(_____) _____
PHONE NUMBER

The name and address of the Resident Agency of Surety is:

(_____) _____
PHONE NUMBER

SIGNATURE OF LICENSED LOCAL
RECORDING AGENT appointed to countersign
on behalf of Surety (Required by Art. 21.09 of the
Insurance Code)

I, _____, having executed Bonds
SIGNATURE

for _____ do hereby affirm I have
NAME OF SURETY

verified that said Surety is now certified with Authority from either: (a) the Secretary of the Treasury of the United States if the project funding includes Federal monies; or (b) the State of Texas if none of the project funding is from Federal sources; and further, said Surety is in no way limited or restricted from furnishing Bond in the State of Texas for the amount and under conditions stated herein.

Central Texas Regional Mobility Authority

290E WALL STABILIZATION PROJECT

CTRMA CONTRACT NO. 23290E22701M

PAYMENT BOND

STATE OF TEXAS
COUNTY OF _____

KNOW ALL MEN BY THESE PRESENTS: That _____

_____ of the City of _____

County of _____, and State of _____, as Principal
(hereinafter referred to as the "Principal"), and

_____ authorized under the laws of the State of Texas to act as Surety on bonds for principals (hereinafter referred to as the "Surety"), are held and firmly bound unto Central Texas Regional Mobility Authority, (hereinafter referred to as the "Authority"), in the penal sum of

_____ Dollars

(\$ _____) for the payment whereof, the said Principal and Surety bind themselves, their heirs, administrators, executors, successors and assigns, jointly and severally, by these presents:

WHEREAS, the Principal has entered into a certain written contract with the Authority, dated the _____ day of _____, 20__ (the "Contract"), to which the said Contract, along with the Contract Documents referenced therein are hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH, that if the said Principal shall pay all claimants supplying labor and material to him or a subcontractor in the prosecution of the Work provided for in said Contract, then, this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, HOWEVER, that this bond is executed pursuant to the provisions of Chapter 2253 of the Texas Government Code, as amended and all liabilities on this bond shall be determined in accordance with the provisions of said Chapter to the same extent as if it were copied at length herein.

SURETY, for value received, stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the Work performed thereunder, or to the other Contract Documents accompanying the same, shall in anyway affect its obligation on this bond, and it does hereby waive notice of such change, extension of time, alteration or addition to the terms of the Contract, or to the work to be performed thereunder or to the other Contract Documents accompanying the same.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20____.

PRINCIPAL

SURETY

SIGNATURE

SIGNATURE

NAME & TITLE

NAME & TITLE

ADDRESS

ADDRESS

(_____) _____
PHONE NUMBER

(_____) _____
PHONE NUMBER

The name and address of the Resident Agency of Surety is:

(_____) _____
PHONE NUMBER

SIGNATURE OF LICENSED LOCAL
RECORDING AGENT appointed to countersign
on behalf of Surety (Required by Art. 21.09 of the
Insurance Code)

Central Texas Regional Mobility Authority

290E WALL STABILIZATION PROJECT

CTRMA CONTRACT NO. 23290E22701M

RECEIPT OF ADDENDA

Receipt of addendum, if issued, must be acknowledged electronically on the CivCast website.

Failure to confirm receipt of all addenda issued will result in the bid being deemed non-responsive.

Signature

Date

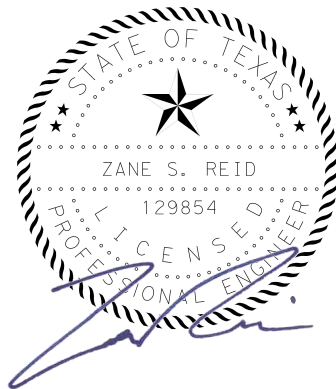
Central Texas Regional Mobility Authority

290E WALL STABILIZATION PROJECT

CTRMA CONTRACT NO. 23290E22701M

ENGINEER'S SEAL

The enclosed Specifications, Special Provisions, General Notes, and Specification Data in this document have been selected by me, or under my responsible supervision as being applicable to this project.



PREPARED BY:

ATKINS

TBPE REG. #F-474

11801 Domain Blvd., Suite 500
Austin, Texas, 78758
512-327-6840 PH
512-327-2453 FX

11/11/2022

Alteration of a sealed document without proper notification to the responsible engineer is an offence under the Texas Engineering Practice Act.

GENERAL NOTES:

GENERAL

Perform work during good weather. If work is damaged by a weather event, the Contractor is responsible for all costs associated with replacing damaged work.

Remove and replace, at the Contractor's expense, and as directed, all defective work, which was caused by the Contractor's workforce, materials, or equipment.

The "Engineer" shall be the Mobility Authority's consultant identified by the Mobility Authority at the pre-construction meeting.

References to manufacturer's trade name or catalog numbers are for the purpose of identification only. Similar materials from other manufacturers are permitted if they are of equal quality, comply with the specifications for this project, and are approved.

If work is performed at Contractor's option, when inclement weather is impending, and the work is damaged by subsequent precipitation, the Contractor is responsible for all costs associated with replacing the work, if required.

Equip all construction equipment used in roadway work with highly visible omnidirectional flashing warning lights.

Intelligent Transportation Systems (ITS) Infrastructure and Toll Collection System Infrastructure exists within the limits of this project and the system must remain operational throughout construction. Backbone and hub communication fiber links are critical and must be maintained during the duration of the project. Use caution if working in these areas to avoid damaging or interfering with existing facilities and infrastructure. In the event of TxDOT system damage, notify TxDOT at (512) 974-0883 and the Toll Operations Division at (512) 874-9177 within one hour of occurrence. In the event of Mobility Authority Toll system or ITS system damage, notify the Mobility Authority Director of Operations at (512) 996-9778 within one hour of occurrence. Failure of the Contractor to repair damage within 8 hours of occurrence to any infrastructure that conveys any corridor information to TxDOT/Mobility Authority will result in the Contractor being billed for the full cost of emergency repairs performed by others. Damage to any toll collection system infrastructure impacting the ability of the TxDOT/Authority to collect, process or transmit transactions will result in the Contractor being billed for lost revenue damages. Revenue damages will be based on historical revenue collected from the affected gantries.

Use a self-contained vacuum broom to sweep the roadway and keep it free of sediment as directed. The contractor will be responsible for any sweeping above and beyond the normal maintenance required to keep fugitive sediment off the roadway as directed by the Engineer.

Protect all areas of the right of way (ROW), which are not included in the actual limits of the proposed construction areas, from disturbance. Restore any area disturbed because of the Contractor's operations to a condition as good as, or better than, before the beginning of work at no cost to the Mobility Authority.

Remove all loose Formwork and other Materials from the Floodplain or drainage areas, daily, which could float off in a Stormwater Event, as directed.

Damage to existing pipes and SETs due to Contractor operations will be repaired at Contractor's expense.

All locations used for storing construction equipment, materials, and stockpiles of any type, within the ROW, will be as directed. Use of ROW for these purposes will be restricted to those locations where driver sight distance to businesses and side street intersections is not obstructed and at other locations where an unsightly appearance will not exist. The Contractor will not have exclusive use of ROW but will cooperate in the use of the ROW with the city/county, various public utility companies and other contractors as required.

Meet weekly with the Engineer to notify of planned work for the upcoming week. Provide a three-week "look ahead", as well as all work performed over the past week.

Coordinate and obtain approval for all work over existing roadways.

The Project Superintendent will always be available to contact when work is being performed, including subcontractor work. The Superintendent will be available and on-call 24 hours a day.

During evacuation periods for Hurricane events the Contractor will cooperate with the Mobility Authority and TxDOT for the restricting of Lane Closures and arranging for Traffic Control to facilitate Coastal Evacuation Efforts.

Overhead and underground utilities may exist in the vicinity of the project. The exact location of underground utilities may not be known. Refer to ITEM 5 – CONTROL OF THE WORK, for utility rates. If working near power lines, comply with the appropriate sections of Local Legal Requirements, Texas State Law, and Federal Regulations relating to the type of work involved.

Provide vertical clearance for all structures (including overhead sign bridge structures and bridge mounted signs) within the project limits. Submit information and notices to the Mobility Authority.

Contractor is responsible for all toll charges incurred by Contractor vehicles.

ITEM 4 – SCOPE OF WORK

Final clean up will include the removal of excess material considered detrimental to vegetation growth along the front slope of the ditch. Materials, as specified by the Engineer, will be removed at the Contractor's expense.

ITEM 5 – CONTROL OF THE WORK

Provide a 48-hour advance email notice to AUS_Locate@txdot.gov to request illumination, traffic signal, ITS, or toll equipment utility locates on TxDOT's system (US 290). Provide 2-week advance notice to the Engineer to request locates on the Mobility Authority's system (290). Contractor is responsible for verifying the location of the ITS duct bank within the retaining wall prior to construction.

Before the Authority or its contractor begins work on State right of way, the entity performing the work shall provide TxDOT with a fully executed copy of TxDOT's Form 1560 Certificate of Insurance verifying the existence of coverage in the amounts and types specified on the Certificate of Insurance for all persons and entities working on State right of way. This coverage shall be maintained until all work on TxDOT right of way is complete. If coverage is not maintained, all work on State right of way shall cease immediately, and TxDOT may recover damages and all costs of completing the work.

Electronic Shop Drawing Submittals:

Submit electronic shop drawing submittals according using the Mobility Authority's Electronic Data Management System (EDMS), which will be established for the Project prior to commencing construction. Submittals will be addressed to the Engineer and additional staff, as appropriate.

ITEM 7 – LEGAL RELATIONS AND RESPONSIBILITIES

Refer to the Environmental Permits, Issues and Commitments (EPIC) plan sheets for additional requirements and permits.

Erosion control and stabilization measures must be initiated immediately in portions of the site where construction activities have temporarily ceased and will not resume for a period of time exceeding 14 calendar days. Track all exposed soil, stockpiles and slopes. Tracking consists of operating 2 tracked vehicles or equipment up and down the slope, leaving track marks perpendicular to the direction of the slope. Re-track slopes and stockpiles after each rain event or every 14 days, whichever occurs first. This work is subsidiary.

Do not park equipment where driver sight distance to businesses and side street intersections is obstructed, especially after work hours. If it is necessary to park where drivers' views are blocked, make every effort to flag traffic accordingly. Give the traveling public first priority.

Perform maintenance of vehicles or equipment at designated maintenance sites. Keep a spill kit on-site during fueling and maintenance. This work is subsidiary.

Migratory Birds and Bats.

Migratory birds and bats may be nesting within the project limits and concentrated on roadway structures such as bridges and culverts. Remove all old and unoccupied migratory bird nests from any structures, trees, etc. between September 16 and February 28. Prevent migratory birds from re-nesting or perform construction activities between March 1 and September 15. All methods used for the removal of old nesting areas and the prevention of re-nesting must be submitted to the Mobility Authority 30 business days prior to begin work. This work is subsidiary.

If active nests are encountered on-site during construction, all construction activity within 50 ft. of the nest must stop. Contact the Engineer to determine how to proceed.

No extension of time or compensation payment will be granted for a delay or suspension of work due to the above bird and bat requirements.

Law Enforcement Personnel.

A maximum combined rate of \$70 per hour for the law enforcement personnel and the patrol vehicle will be allowed. Any scheduling fee is subsidiary per Standard Specification 502.4.2.

Cancel law enforcement personnel when the event is canceled. Cancellation, minimums or "show up" fees will not be paid when cancellation is made 12 hours prior to beginning of the event. Failure to cancel within 12 hours will not be cause for payment for cancellation, minimums, or "show up" time. Payment of actual "show up" time to the event site due to cancellation will be on a case by case basis at a maximum of 2 hours per officer. Contractor must use CTRMA provided form to be reimbursed.

Alterations to the cancellation and maximum rate must be approved by the Engineer or pre-determined by official policy of the officers governing authority.

Back Up Alarm

For hours 9 P to 5 A, utilize a non-intrusive, self-adjusting noise level reverse signal alarm. This is not applicable to hot mix or seal coat operations. This is subsidiary.

ITEM 8 – PROSECUTION AND PROGRESS

The Contractor will have 47 working days from NTP to have all installations complete.

Electronic versions of schedules will be saved in native format and delivered in native and PDF formats.

Working days will be charged based on a standard workweek. Working days will be charged Monday through Friday, excluding national or state holidays, if weather or other conditions permit the performance of the principal unit of work underway, as determined by the Engineer, for a continuous period of at least 7 hr. between 7:00 A.M. and 6:00 P.M., unless otherwise shown in the Contract. The Contractor has the option of working on Saturdays or state holidays. Provide sufficient advance notice to the Engineer when scheduling work on Saturdays. Work on Sundays and national holidays will not be permitted without written permission of the Engineer. If work requiring an Inspector to be present is performed on a Saturday, Sunday, or holiday, and weather or other conditions permit the performance of work for 7 hr. between 7:00 A.M. and 6:00 P.M., a working day will be charged.

Provide via email a 3-week look-ahead schedule in Gantt chart format. Submit weekly by noon on Friday. Designate each activity as night or day shift and include the name of the foreman or contractor. The chart shall have a specific section dedicated solely to lane closures and detours. Each lane closure and detour shall be an individual item on the schedule.

Lane Closure Assessments will be assessed as shown in the **Table 1** below.

Any unauthorized lane closures will result in an assessment to the Contractor of \$1,000 per lane per hour or the assigned Lane Closure Assessments in the table, whichever is the higher amount.

All Lane Closure Assessments for the Contractor will be subtracted from the value of the payment application for that associated period.

Table 1: Lane Closure Assessment Rates

Lane Closure Period	Late Charges (Per Lane)			
	290 Toll		US 290	
	Lane	Shoulder	Lane	Shoulder
0-15 mins	\$1,000	\$1,000	\$1,000	\$1,000
15-30 mins	\$2,000	\$2,000	\$2,000	\$2,000
30-45 mins	\$3,000	\$3,000	\$3,000	\$3,000
45-60 mins	\$4,000	\$4,000	\$4,000	\$4,000
Every additional 15-minute interval after 1 hour	\$2,000	\$2,000	\$2,000	\$2,000

For example: If the contractor has one lane of traffic closed on US 290 until Monday at 5:32 a.m., the contractor is 32 minutes outside of the allowable lane closure period. The late charges will be accrued as follows:

$$1 \text{ lane closed} \times [\$1,000 + \$1,000 + \$1,000] = \$3000$$

Emergency lane closures are not subject to lane closure assessments. Emergency lane closures are defined as closures caused by circumstances other than those caused by the contractor and shall be approved by the authority.

Refer to Table 2. Allowable Lane Closure for available lane closure times.

ITEM 9 – MEASUREMENT AND PAYMENT

Provide full-time, off-duty, uniformed, certified peace officers in officially marked vehicles, as part of traffic control operations, as directed.

Show proof of certification by the Texas Commission on Law Enforcement Standards.

No payment will be made for peace officers unless the Contractor completes the proper Department tracking form. Submit invoices that agree with the tracking form for payment at the end of each month, when approved services were provided. Request the tracking form from the Department.

No payment for officers used for moving equipment without prior written approval.

Cancel “Off-Duty” Peace Officers and their Motor Vehicle Units when the Scheduled lane closures are canceled. Failure to cancel the Off-Duty Officers and their respective Motor Vehicle Units will not be the cause for payment, by Mobility Authority, for “Show Up” time.

ITEM 132 – EMBANKMENT TY C

Do not furnish shale clays. The Engineer must approve the embankment material before use on the project.

TY C Requirements

Description	Percent Retained					LL Max	PI Max	PI Min
	3”	1 3/4”	3/8”	#4	#40			
EMBANKMENT (ORD COMP) (TY C)	0	-	-	-	15-100	45	20	8

ITEM 423 – RETAINING WALLS

Contractor shall submit temporary retaining wall design, calculation, and shop drawings for approval.

Mow strip shall be 2ft. wide unless otherwise shown on the plans.

ITEM 432 - RIPRAP

Mow strip riprap will be 4 in. and all other riprap will be 5 in. unless otherwise shown on the plans or in the pay items.

Saw-cut existing riprap then epoxy 12 in. long No. 3 or No. 4 bars 6 in. deep at a maximum spacing of 18 in. in each direction to tie new riprap to existing riprap. This work is subsidiary.

ITEM 502 – BARRICADES, SIGNS, AND TRAFFIC HANDLING

Table 2. Allowable Lane Closure

Roadway	Limits	Allowable Closure Time*
		Weekday
290 Toll	Arterial A to Parmer Lane	9 P to 5 A
US 290	Arterial A to Parmer Lane	9 P to 5 A
Harris Branch Pkwy	Blue Goose Rd to Lindell Ln	9 P to 5 A

* Allowable Closure Time includes setup and cleanup time.

For roadways without defined allowable closure times, nighttime lane closures will be allowed from 8 P to 5 A. Unless stated, daytime or Friday night lane closures will not be allowed and one lane in each direction will remain open at all times for all roadways.

Full mainlane closures will not be allowed. Full ramp closures must be approved by the Engineer.

No closures will be allowed on Friday night.

No closures will be allowed on the weekends adjacent to, working day prior, and working day after the National Holidays defined in the Standard Specifications and Easter weekend. Closures the Sunday of the Super Bowl will not be allowed from 1 P to 11 P. No closures will be allowed on Friday and the weekends for Formula 1 at Circuit of the Americas, Austin City Limits Fest, South by Southwest, Republic of Texas Rally, UT home football games, Rodeo Austin, State of Texas sales tax holiday, or other special events that could be impacted by the construction. All lanes will be open by noon of the day before these special events.

To account for directional traffic volumes, begin and end times of closures may be shifted equally by the Engineer. The closure duration will remain. Added compensation is not allowed. Submit an emailed request for a lane closure (LCN) to the Mobility Authority. The email will be submitted in the format provided. Receive concurrence prior to implementation. Submit a cancellation of lane closures a minimum of 18 hours prior to implementation. Blanket requests for extended periods are not allowed. Max duration of a request is 2 weeks prior to requiring resubmittal. Provide 2-hour notice prior to implementation and immediately upon removal of the closure.

Maintain a minimum of 1 through lane in each direction, unless otherwise directed in plans.

For roadways listed in Table 2: Submit the request 96 hours prior to implementation.

For roadways not listed in Table 2: Submit the request a minimum of 48 hours prior to the closure and by the following deadline immediately prior to the closure: 11A on Tuesday or 11A on Friday.

Cancellations of accepted closures (not applicable to full closures or detours) due to weather will not require resubmission in accordance with the above restrictions if the work is completed during the next allowable closure time.

In the case of an unauthorized lane closure, all approved LCNs will be revoked until a meeting is held between the contractor and the Engineer. No lane closure notices will be approved until the meeting is concluded.

Coordinate Main Lane closures with adjacent projects including those projects owned by other agencies and departments. Closures that conflict with adjacent contractor will be prioritized according to critical path work per latest schedule. Conflicting critical path or non-critical work will be approved for first LCN submitted. Denial of a closure due to prioritization or other reasons will not be reason for time suspension, delay, overhead, etc.

Cover, relocate or remove existing signs that conflict with traffic control. Install all permanent signs, delineation, and object markers required for the operation of the roadway before opening to traffic. Use of temporary mounts is allowed or may be required until the permanent mounts are installed or not impacted by construction. Maintain the temporary mounts. This work is subsidiary.

Shadow Vehicle with TMA is required as shown in the TCP sheets and for setup/removal of traffic control devices.

Meet with the Engineer prior to lane closures to ensure that sufficient equipment, materials, devices, and workers will be used. Take immediate action to modify traffic control, if at any time the queue becomes greater than 20 minutes. Have a contingency plan of how modification will occur. Consider inclement weather prior to implementing the lane closures. Do not set up traffic control when the pavement is wet.

Do not set up traffic control when the pavement is wet.

Maintain access to all streets and driveways at all times, unless otherwise approved. Considered subsidiary to the pertinent Items.

ITEM 506 – TEMPORARY EROSION, SEDIMENTATION, AND ENV CONTROLS

Install, maintain, remove control measures in areas of the right of way utilized by the Contractor that are outside the limits of disturbance required for construction. Permanently stabilize the area. This work is subsidiary.

ITEM 512 – PORTABLE TRAFFIC BARRIER

Any increase in temporary barrier quantities that occur due to the Contractor changes in the sequence of work or the traffic control plan will not be paid.

ITEM 752 – TREE AND BRUSH REMOVAL

Flailing equipment is not allowed. Burning brush is not allowed in urban areas or on ROW. Use hand methods or other means of removal if doing work by mechanical methods is impractical.

Prior to begin tree pruning, send email confirmation to the Engineer that training and demonstration of work method has been provided to the employees. This work is subsidiary.

ITEM 6001 – PORTABLE CHANGEABLE MESSAGE SIGN

Provide 2 “Electronic” Portable Changeable Message Sign(s) (EPCMS) as part of the traffic control operation. All EPCMS will be exclusive to this project, unless otherwise approved. Placement location and message as directed.

Place appropriate number of “Electronic” Portable Changeable Message Signs (EPCMS) at locations requiring lane closures for one-week prior to the closures, or as directed. Obtain approval for the actual message that will appear on the boards. If more than two phases of a message are required per board, provide additional EPCMS’s to meet the two-phases-per-board requirement. Provide a replacement within 12 hours. EPCMS will be available for traffic control, event notices, roadway conditions, service announcements, etc.

Central Texas Regional Mobility Authority

290E WALL STABILIZATION PROJECT

CTRMA CONTRACT NO. 23290E22701M

SPECIFICATION LIST

PREFACE:

The "Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges" of the Texas Department of Transportation, 2014, as amended and augmented by the Supplemental Specifications following, shall govern the performance of the Contract. These specifications hereby are made a part of the Contract as fully and with the same effect as if set forth at length herein.

Attention is directed to the fact that any other documents printed by the Texas Department of Transportation modifying or supplementing said "Standard Specifications", such as Standard Supplemental Specifications, Special Provisions (by the Department), Notice to Bidders, etc., do not form a part of this Contract nor govern its performance, unless specifically so-stated in the Supplemental Specifications herein contained.

Attention is directed to the use of "Proposal" in standard TxDOT documents included in this contract (Standard Specifications, Special Provisions, & Special Specifications) is equivalent to "Bid" in the Mobility Authority's documents. This shall be accounted for when working contract documents prepared by the Mobility Authority with those standards prepared by TxDOT.

Attention is directed to the use of "Department" in standard TxDOT documents included in this contract (Standard Specifications, Special Provisions, & Special Specifications) is equivalent to "Mobility Authority" in the Mobility Authority's documents.

References made to specific section numbers in these Special Provisions, or in any of the various documents which constitute the complete Contract Documents, shall, unless otherwise denoted, be construed as referenced to the corresponding section of the "Standard Specifications" issued by the Texas Department of Transportation in 2014.

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
GOVERNING SPECIFICATIONS AND SPECIAL PROVISIONS

(STANDARD SPECIFICATIONS, SPECIAL PROVISIONS, AND SPECIAL SPECIFICATIONS)

WHERE DISCREPANCIES OCCUR BETWEEN THE TECHNICAL SPECIFICATIONS, THE FOLLOWING DESCENDING ORDER OF PRIORITY SHALL GOVERN: (1) SPECIAL CONDITIONS, (2) SPECIAL PROVISIONS TO SPECIAL SPECIFICATIONS, (3) SPECIAL SPECIFICATIONS, (4) SPECIAL PROVISIONS, AND (5) STANDARD SPECIFICATIONS.

ALL SPECIFICATIONS AND SPECIAL PROVISIONS APPLICABLE TO THIS PROJECT ARE IDENTIFIED AS FOLLOWS:

STANDARD SPECIFICATIONS: ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION NOVEMBER 1, 2014. STANDARD SPECIFICATIONS ARE INCORPORATED INTO THE CONTRACT BY REFERENCE.

- ITEMS 1-9 GENERAL REQUIREMENTS AND COVENANTS
- ITEM 100 PREPARING RIGHT OF WAY (103)
- ITEM 104 REMOVING CONCRETE
- ITEM 110 EXCAVATION (132)
- ITEM 132 EMBANKMENT (100)(160)(204)(210)(216)(260)(275)(400)
- ITEM 164 SEEDING FOR EROSION CONTROL (162)(164)(166)
- ITEM 168 VEGETATIVE WATERING
- ITEM 421 HYDRAULIC CEMENT CONCRETE(360) (361) (416)
- ITEM 423 RETAINING WALLS(110) (132) (216) (400) (416) (420) (421) (424) (440) (445) (458) (556)
- ITEM 432 RIPRAP (247)(420)(421)(431)(440)
- ITEM 500 MOBILIZATION
- ITEM 502 BARRICADES, SIGNS, AND TRAFFIC HANDLING
- ITEM 506 TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL CONTROLS(161)
(432) (556)
- ITEM 512 PORTABLE CONCRETE TRAFFIC BARRIER
- ITEM 545 CRASH CUSHION ATTENUATORS

ITEM 752 TREE AND BRUSH REMOVAL

SPECIAL PROVISIONS: SPECIAL PROVISIONS WILL GOVERN AND TAKE PRECEDENCE
OVER THE SPECIFICATIONS ENUMERATED HEREON WHEREVER
IN CONFLICT THEREWITH.

SPECIAL PROVISION TO ITEM 000 (000---002---RMA)

SPECIAL PROVISION TO ITEM 000 (000---008)

SPECIAL PROVISION TO ITEM 000 (000---009)

SPECIAL PROVISION TO ITEM 000 (000---011---RMA)

SPECIAL PROVISION TO ITEM 000 (000---659)

SPECIAL PROVISION TO ITEM 000 (000---954---RMA)

SPECIAL PROVISION TO ITEM 000 (000---1243)

SPECIAL PROVISION TO ITEM 001 (001---001---RMA)

SPECIAL PROVISION TO ITEM 002 (002---005---RMA)

SPECIAL PROVISION TO ITEM 002 (002---011)

SPECIAL PROVISION TO ITEM 003 (003---005---RMA)

SPECIAL PROVISION TO ITEM 003 (003---011)

SPECIAL PROVISION TO ITEM 004 (004---001---RMA)

SPECIAL PROVISION TO ITEM 005 (005---002)

SPECIAL PROVISION TO ITEM 005 (005---003)

SPECIAL PROVISION TO ITEM 006 (006---001---RMA)

SPECIAL PROVISION TO ITEM 006 (006---012)

SPECIAL PROVISION TO ITEM 007 (007---003---RMA)

SPECIAL PROVISION TO ITEM 007 (007---004)

SPECIAL PROVISION TO ITEM 007 (007---011)

SPECIAL PROVISION TO ITEM 008 (008---002---RMA)

SPECIAL PROVISION TO ITEM 008 (008---030)

SPECIAL PROVISION TO ITEM 008 (008---033)

SPECIAL PROVISION TO ITEM 009 (009---001---RMA)

SPECIAL PROVISION TO ITEM 009 (009---010)

SPECIAL PROVISION TO ITEM 009 (009---011)

SPECIAL PROVISION TO ITEM 502 (502---008)

SPECIAL PROVISION TO ITEM 506 (506---002)

SPECIAL SPECIFICATIONS:

ITEM 4079 PRESTRESSED GROUND ANCHORS

ITEM 6001 PORTABLE CHANGEABLE MESSAGE SIGN

ITEM 6064 INTELLIGENT TRANSPORTATION SYSTEM (ITS) POLE WITH CABINET

GENERAL:

THE ABOVE-LISTED SPECIFICATION ITEMS ARE THOSE UNDER WHICH PAYMENT IS TO BE MADE. THESE, TOGETHER WITH SUCH OTHER PERTINENT ITEMS, IF ANY, AS MAY BE REFERRED TO IN THE ABOVE-LISTED SPECIFICATION ITEMS, AND INCLUDING THE SPECIAL PROVISIONS LISTED ABOVE, CONSTITUTE THE COMPLETE SPECIFICATIONS FOR THIS PROJECT.

Special Provision to Item 000

Nondiscrimination

1. DESCRIPTION

The Contractor agrees, during the performance of the service under this Agreement, that the Contractor shall provide all services and activities required in a manner that complies with the Civil Rights Act of 1964, as amended, the Rehabilitation Act of 1973, Public Law 93-1122, Section 504, the provisions of the Americans with Disabilities Act of 1990, Public Law 101-336 (S.933), and all other federal and state laws, rules, regulations, and orders pertain to equal opportunity in employment, as if the Contractor were an entity bound to comply with these laws. The Contractor shall not discriminate against any employee or applicant for employment based on race, religion, color, sex, national origin, age or handicapped condition.

2. DEFINITION OF TERMS

Where the term "Contractor" appears in the following six nondiscrimination clauses, the term "Contractor" is understood to include all parties to Contracts or agreements with the Texas Department of Transportation.

3. NONDISCRIMINATION PROVISIONS

During the performance of this Contract, the Contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "Contractor") agrees as follows:

- 3.1. **Compliance with Regulations.** The Contractor (hereinafter includes consultants) will comply with the Acts and the Regulations relative to Nondiscrimination in Federally-assisted programs of the U.S. Department of Transportation, the Federal Highway Administration, as they may be amended from time to time, which are herein incorporated by reference and made a part of this Contract.
- 3.2. **Nondiscrimination.** The Contractor, with regard to the work performed by it during the Contract, will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Contractor will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the Contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.
- 3.3. **Solicitations for Subcontracts, Including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding, or negotiation made by the Contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the Contractor of the Contractor's obligations under this Contract and the Acts and the Regulations relative to Nondiscrimination on the grounds of race, color, or national origin.
- 3.4. **Information and Reports:** The Contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Recipient or the Federal Highway Administration to be pertinent to ascertain compliance with such Acts, Regulations, and instructions. Where any information required of a Contractor is in the exclusive possession of another who fails or refuses to furnish the information, the Contractor will so certify to the Recipient or the Federal Highway Administration, as appropriate, and will set forth what efforts it has made to obtain the information.
- 3.5. **Sanctions for Noncompliance.** In the event of a Contractor's noncompliance with the Nondiscrimination provisions of this Contract, the Recipient will impose such Contract sanctions as it or the Federal Highway Administration may determine to be appropriate, including, but not limited to:

- withholding payments to the Contractor under the Contract until the Contractor complies, and/or
- cancelling, terminating, or suspending a Contract, in whole or in part.

3.6. **Incorporation of Provisions.** The Contractor will include the provisions of paragraphs (3.1) through (3.6) in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations, and directives issued pursuant thereto. The Contractor will take action with respect to any subcontract or procurement as the Recipient or the Federal Highway Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the Contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the Contractor may request the Recipient to enter into any litigation to protect the interests of the Recipient. In addition, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

4. PERTINENT NONDISCRIMINATION AUTHORITIES:

During the performance of this Contract, the Contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "Contractor") agrees to comply with the following nondiscrimination statutes and authorities; including but not limited to:

- 4.1. Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq., 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21.
- 4.2. The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- 4.3. Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 et seq.), (prohibits discrimination on the basis of sex);
- 4.4. Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 et seq.), as amended, (prohibits discrimination on the basis of disability); and 49 CFR Part 27;
- 4.5. The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 et seq.), (prohibits discrimination on the basis of age);
- 4.6. Airport and Airway Improvement Act of 1982, (49 U.S.C. § 4 71, Section 4 7123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex);
- 4.7. The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, subrecipients and Contractors, whether such programs or activities are Federally funded or not);
- 4.8. Titles II and III of the Americans with Disabilities Act, which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131-12189) as implemented by Department of Transportation regulations at 49 C.F.R. parts 37 and 38;
- 4.9. The Federal Aviation Administration's Nondiscrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex);
- 4.10. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures discrimination against minority populations by discouraging programs,

policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations;

- 4.11. Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100);
- 4.12. Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U .S.C. 1681 et seq).

Special Provision to Item 000

Special Labor Provisions for State Projects



1. GENERAL

This is a "Public Works" Project, as provided under Government Code Title 10, Chapter 2258, "Prevailing Wage Rates," and is subject to the provisions of the Statute. No provisions in the Contract are intended to be in conflict with the provisions of the Statute.

The Texas Transportation Commission has ascertained and indicated in the special provisions the regular rate of per diem wages prevailing in each locality for each craft or type of worker. Apply the wage rates contained in the specifications as minimum wage rates for the Contract.

2. MINIMUM WAGES, HOURS AND CONDITIONS OF EMPLOYMENT

All workers necessary for the satisfactory completion of the work are within the purview of the Contract.

Whenever and wherever practical, give local citizens preference in the selection of labor.

Do not require any worker to lodge, board or trade at a particular place, or with a particular person as a condition of employment.

Do not charge or accept a fee of any from any person who obtains work on the project. Do not require any person who obtains work on the project to pay any fee to any other person or agency obtaining employment for the person on the project.

Do not charge for tools or equipment used in connection with the duties performed, except for loss or damage of property. Do not charge for necessary camp water.

Do not charge for any transportation furnished to any person employed on the project.

The provisions apply where work is performed by piece work, station work, etc. The minimum wage paid will be exclusive of equipment rental on any shipment which the worker or subcontractor may furnish in connection with his work.

Take responsibility for carrying out the requirements of this specification and ensure that each subcontractor working on the project complies with its provisions.

Any form of subterfuge, coercion or deduction designed to evade, reduce or discount the established minimum wage scales will be considered a violation of the Contract.

The Fair Labor Standards Acts (FLSA) established one and one-half (1-1/2) pay for overtime in excess of 40 hours worked in 1 week. Do not consider time consumed by the worker in going to and returning from the place of work as part of the hours of work. Do not require or permit any worker to work in excess of 40 hours in 1 week, unless the worker receives compensation at a rate not less than 1-1/2 times the basic rate of pay for all hours worked in excess of 40 hours in the workweek.

The general rates of per diem wages prevailing in this locality for each class and type of workers whose services are considered necessary to fulfill the Contract are indicated in the special provisions, and these rates govern as minimum wage rates on this Contract. A penalty of \$60.00 per calendar day or portion of a calendar day for each worker that is paid less than the stipulated general rates of per diem wages for any work done under the Contract will be deducted. The Department, upon receipt of a complaint by a worker,

will determine within 30 days whether good cause exists to believe that the Contractor or a subcontractor has violated wage rate requirements and notify the parties involved of the findings. Make every effort to resolve the alleged violation within 14 days after notification. The next alternative is submittal to binding arbitration in accordance with the provisions of the Texas General Arbitration Act (Art. 224 et seq., Revised Statutes).

Notwithstanding any other provision of the Contract, covenant and agree that the Contractor and its subcontractors will pay each of their employees and contract labor engaged in any way in work under the Contract, a wage not less than what is generally known as the "federal minimum wage" as set out in 29 U.S.C. 206 as that Statute may be amended from time to time.

Pay any worker employed whose position is not listed in the Contract, a wage not less than the per diem wage rate established in the Contract for a worker whose duties are most nearly comparable.

3. RECORD AND INSPECTIONS

Keep copies of weekly payrolls for review. Require subcontractors to keep copies of weekly payrolls for review. Show the name, occupation, number of hours worked each day and per diem wage paid each worker together with a complete record of all deductions made from such wages. Keep records for a period of 3 years from the date of completion of the Contract.

Where the piece-work method is used, indicate on the payroll for each person involved:

- Quantity of piece work performed.
- Price paid per piece-work unit.
- Total hours employed.

The Engineer may require the Contractor to file an affidavit for each payroll certifying that payroll is a true and accurate report of the full wages due and paid to each person employed.

Post or make available to employees the prevailing wage rates from the Contract. Require subcontractors to post or make available to employees the prevailing wage rates from the Contract.

Special Provision to Item 000

Small Business Enterprise in State Funded Projects



1. DESCRIPTION

The purpose of this Special Provision is to carry out the Texas Department of Transportation's policy of ensuring that Small Business Enterprise (SBE) has an opportunity to participate in the performance of contracts. If the SBE goal is greater than zero, Article A of this Special Provision shall apply to this Contract; otherwise, Article B of this Special Provision applies. The percentage goal for SBE participation in the work to be performed under this contract will be shown in the proposal.

2. DEFINITIONS

Small Business Enterprise (SBE) is a firm (including affiliates) certified by the Department whose annual gross receipts do not exceed the U.S. Small Business Administration's size standards for 4 consecutive years. Firms certified as Historically Underutilized Businesses (HUBs) by the Texas Comptroller of Public Accounts and as Disadvantaged Business Enterprises (DBEs) by the Texas Uniform Certification Program automatically qualify as SBEs.

2.1. Article A - SBE Goal is Greater than Zero.

2.1.1. **Policy.** The Department is committed to providing contracting opportunities for small businesses. In this regard, it is the Department's policy to develop and maintain a program in order to facilitate contracting opportunities for small businesses. Consequently, the requirements of the Department's Small Business Enterprise Program apply to this contract as follows:

2.1.1.1. The Contractor shall make a good faith effort to meet the SBE goal for this contract.

2.1.1.2. The Contractor and any Subcontractors shall not discriminate on the basis of race, color, national origin, age, disability or sex in the award and performance of this contract. These nondiscrimination requirements shall be incorporated into any subcontract and purchase order.

2.1.1.3. After a conditional award is made to the low bidder, the Department will determine the adequacy of a Contractor's efforts to meet the contract goal, as is outlined under Section 2, "Contractor's Responsibilities." If the requirements of Section 2 are met, the contract will be forwarded to the Contractor for execution.

The Contractor's performance, during the construction period of the contract in meeting the SBE goal, will be monitored by the Department.

2.1.2. **Contractor's Responsibilities.** These requirements must be satisfied by the Contractor. A SBE Contractor may satisfy the SBE requirements by performing at least 25% of the contract work with its own organization as defined elsewhere in the contract.

2.1.2.1. The Contractor shall submit a completed SBE Commitment Agreement Form for each SBE they intend to use to satisfy the SBE goal so as to arrive in the Department's Office of Civil Rights (OCR) in Austin, Texas not later than 5:00 p.m. on the 10th business day, excluding national holidays, after the conditional award of the contract. When requested, additional time, not to exceed 7 business days, excluding national holidays, may be granted based on documentation submitted by the Contractor.

2.1.2.2. A Contractor who cannot meet the contract goal, in whole or in part, shall document the good faith efforts taken to meet the SBE goal. The Department will consider as good faith efforts all documented explanations

that are submitted and that describe a Contractor's failure to meet a SBE goal or obtain SBE participation, including:

- 2.1.2.2.1. Advertising in general circulation, trade association, and/or minority/women focus media concerning subcontracting opportunities,
- 2.1.2.2.2. Dividing the contract work into reasonable portions in accordance with standard industry practices,
- 2.1.2.2.3. Documenting reasons for rejection or meeting with the rejected SBE to discuss the rejection,
- 2.1.2.2.4. Providing qualified SBEs with adequate information about bonding, insurance, plans, specifications, scope of work, and the requirements of the contract,
- 2.1.2.2.5. Negotiating in good faith with qualified SBEs, not rejecting qualified SBEs who are also the lowest responsive bidder, and;
- 2.1.2.2.6. Using the services of available minorities and women, community organizations, contractor groups, local, state and federal business assistance offices, and other organizations that provide support services to SBEs.
- 2.1.2.3. The good faith effort documentation is due at the time and place specified in Subarticle 2.(a). of this Special Provision. The Director of the DBE & SBE Programs Section will evaluate the Contractor's documentation. If it is determined that the Contractor has failed to meet the good faith effort requirements, the Contractor will be given an opportunity for reconsideration by the Department.
- 2.1.2.4. Should the bidder to whom the contract is conditionally awarded refuse, neglect or fail to meet the SBE goal and/or demonstrate to the Department's satisfaction sufficient efforts to obtain SBE participation, the proposal guaranty filed with the bid shall become the property of the State, not as a penalty, but as liquidated damages to the Department.
- 2.1.2.5. The Contractor must not terminate a SBE subcontractor submitted on a commitment agreement for a contract with an assigned goal without the prior written consent of the Department.
- 2.1.2.6. The Contractor shall designate a SBE contact person who will administer the Contractor's SBE program and who will be responsible for submitting reports, maintaining records, and documenting good faith efforts to use SBEs.
- 2.1.2.7. The Contractor must inform the Department of the representative's name, title and telephone number within 10 days of beginning work.
- 2.1.3. **Eligibility of SBEs.**
- 2.1.3.1. The Department certifies the eligibility of SBEs.
- 2.1.3.2. The Department maintains and makes available to interested parties a directory of certified SBEs.
- 2.1.3.3. Only firms certified at the time of letting or at the time the commitments are submitted are eligible to be used in the information furnished by the Contractor required under Section 2.(a) above.
- 2.1.3.4. Certified HUBs and DBEs are eligible as SBEs.
- 2.1.3.5. Small Business Size Regulations and Eligibility is referenced on e-CFR (Code of Federal Regulations), Title 13 – Business Credit and Assistance, Chapter 1 – Small Business Administration, Part 121 – Small Business Size Regulations, Subpart A – Size Eligibility Provisions and Standards.
- 2.1.4. **Determination of SBE Participation.** SBE participation shall be counted toward meeting the SBE goal in this contract in accordance with the following:

- 2.1.4.1. A Contractor will receive credit for all payments actually made to a SBE for work performed and costs incurred in accordance with the contract, including all subcontracted work.
- 2.1.4.2. A SBE Contractor or subcontractor may not subcontract more than 75% of a contract. The SBE shall perform not less than 25% of the value of the contract work with its own organization.
- 2.1.4.3. A SBE may lease equipment consistent with standard industry practice. A SBE may lease equipment from the prime contractor if a rental agreement, separate from the subcontract specifying the terms of the lease arrangement, is approved by the Department prior to the SBE starting the work in accordance with the following:
- 2.1.4.3.1. If the equipment is of a specialized nature, the lease may include the operator. If the practice is generally acceptable with the industry, the operator may remain on the lessor's payroll. The operator of the equipment shall be subject to the full control of the SBE, for a short term, and involve a specialized piece of heavy equipment readily available at the job site.
- 2.1.4.3.2. For equipment that is not specialized, the SBE shall provide the operator and be responsible for all payroll and labor compliance requirements.
- 2.1.5. **Records and Reports.**
- 2.1.5.1. The Contractor shall submit monthly reports, after work begins, on SBE payments, (including payments to HUBs and DBEs). The monthly reports are to be sent to the Area Engineer's office. These reports will be due within 15 days after the end of a calendar month.
- These reports will be required until all SBE subcontracting or supply activity is completed. The "SBE Progress Report" is to be used for monthly reporting. Upon completion of the contract and prior to receiving the final payment, the Contractor shall submit the "SBE Final Report" to the Office of Civil Rights and a copy to the Area Engineer. These forms may be obtained from the Office of Civil Rights and reproduced as necessary. The Department may verify the amounts being reported as paid to SBEs by requesting, on a random basis, copies of invoices and cancelled checks paid to SBEs. When the SBE goal requirement is not met, documentation supporting Good Faith Efforts, as outlined in Section 2.(b) of this Special Provision, must be submitted with the Final Report.
- 2.1.5.2. SBE subcontractors and/or suppliers should be identified on the monthly report by SBE certification number, name and the amount of actual payment made to each during the monthly period. **These reports are required regardless of whether or not SBE activity has occurred in the monthly reporting period.**
- 2.1.5.3. All such records must be retained for a period of 3 years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the Department.
- 2.1.6. **Compliance of Contractor.** To ensure that SBE requirements of this contract are complied with, the Department will monitor the Contractor's efforts to involve SBEs during the performance of this contract. This will be accomplished by a review of monthly reports submitted by the Contractor indicating his progress in achieving the SBE contract goal and by compliance reviews conducted by the Department.
- A Contractor's failure to comply with the requirements of this Special Provision shall constitute a material breach of this contract. In such a case, the Department reserves the right to employ remedies as the Department deems appropriate in the terms of the contract.
- 2.2. **Article B - No SBE Goal.**
- 2.2.1. **Policy.** It is the policy of the Department that SBEs shall have an opportunity to participate in the performance of contracts. Consequently, the requirements of the Department's Small Business Enterprise Program apply to this contract as specified in Section 2-5 of this Article.

- 2.2.2. **Contractor's Responsibilities.** If there is no SBE goal, the Contractor will offer SBEs an opportunity to participate in the performance of contracts and subcontracts.
- 2.2.3. **Prohibit Discrimination.** The Contractor and any subcontractor shall not discriminate on the basis of race, color, national origin, religion, age, disability or sex in the award and performance of contracts. These nondiscrimination requirements shall be incorporated into any subcontract and purchase order.
- 2.2.4. **Records and Reports.**
- 2.2.4.1. The Contractor shall submit reports on SBE (including HUB and DBE) payments. The reports are to be sent to the Area Engineer's office. These reports will be due annually by the 31st of August or at project completion, whichever comes first.
- These reports will be required until all SBE subcontracting or supply activity is completed. The "SBE Progress Report" is to be used for reporting. Upon completion of the contract and prior to receiving the final payment, the Contractor shall submit the "SBE Final Report" to the Office of Civil Rights and a copy to the Area Engineer. These forms may be obtained from the Office of Civil Rights and reproduced as necessary. The Department may verify the amounts being reported as paid to SBEs by requesting copies of invoices and cancelled checks paid to SBEs on a random basis.
- 2.2.4.2. SBE subcontractors and/or suppliers should be identified on the report by SBE Certification Number, name and the amount of actual payment made.
- 2.2.4.3. All such records must be retained for a period of 3 years following completion of the contract work and shall be available at reasonable times and places for inspection by authorized representatives of the Department.

Special Provision to Item 000

Buy America

Steel and iron products to be incorporated into the project must be of domestic origin. All manufacturing processes for steel and iron products to be incorporated into the project must take place domestically, including donated material.

Reminders:

Depending on the Steel/iron item received at the project, described below are the requirements for acceptance.

1. Steel and Iron Items Inspected and Tested by CSTIM&P

- The project engineer receives CST/M&P Structural Test Reports as proof of compliance with the requirements of the specification.
- CST/M&P obtains from the supplier a completed Form 1818 (D-9-USA-1), "Material Statement" with attached MTRs, certifications, galvanizing reports, etc.

2. Steel and Iron Items Received and Sampled by the Project Engineer for Testing by CSTIM&P

- The project engineer submits samples with the required documentation obtained from the supplier (completed Form 1818 (D-9-USA-1) with attached MTRs, certifications, galvanizing reports, etc.) to CST/M&P for testing.
- CSTM&P issues a CST/M&P General Test Report for all passing material (proof of compliance with the requirements of the specifications).

3. Steel and Iron Items Received, Inspected, and Accepted by the Project Engineer

- The project engineer obtains from the supplier the completed Form 1818 (D-9-USA-1) with attached MTRs, certifications, galvanizing reports, etc.
- CST/M&P assists the project engineer when requested.

4. Steel and Iron Items Received from Regional or District Warehouse (Pretested) Stock

- The project engineer obtains documentation verifying the material was obtained from a regional or district warehouse.
- CSTM&P, when requested to inspect and test, obtains from the supplier the completed Form 1818 (D-9-USA-1) with attached MTRs, etc.

Special Provision 000

Notice of Contractor Performance Evaluations



1. GENERAL

In accordance with Texas Transportation Code §223.012, the Engineer will evaluate Contractor performance based on quality, safety, and timeliness of the project.

2. DEFINITIONS

- 2.1. **Project Recovery Plan (PRP)**—a formal, enforceable plan developed by the Contractor, in consultation with the District, that documents the cause of noted quality, safety, and timeliness issues and specifies how the Contractor proposes to correct project-specific performance deficiencies.

In accordance with Title 43, Texas Administrative Code (TAC), §9.23, the District will request a PRP if the Contractor's performance on a project is below the Department's acceptable standards and will monitor the Contractor's compliance with the established plan.

- 2.2. **Corrective Action Plan (CAP)**—a formal, enforceable plan developed by the Contractor, and proposed for adoption by the Construction or Maintenance Division, that documents the cause of noted quality, safety, and timeliness issues and specifies how the Contractor proposes to correct statewide performance deficiencies.

In accordance with 43 TAC §9.23, the Division will request a CAP if the average of the Contractor's statewide final evaluation scores falls below the Department's acceptable standards for the review period and will monitor the Contractor's compliance with the established plan.

3. CONTRACTOR EVALUATIONS

In accordance with Title 43, Texas Administrative Code (TAC) §9.23, the Engineer will schedule evaluations at the following intervals, at minimum:

- Interim evaluations—at or within 30 days after the anniversary of the notice to proceed, for Contracts extending beyond 1 yr., and
- Final evaluation—upon project closeout.

In case of a takeover agreement, neither the Surety nor its performing Contractor will be evaluated.

In addition to regularly scheduled evaluations, the Engineer may schedule an interim evaluation at any time to formally communicate issues with quality, safety, or timeliness. Upon request, work with the Engineer to develop a PRP to document expectations for correcting deficiencies.

Comply with the PRP as directed. Failure to comply with the PRP may result in additional remedial actions available to the Engineer under Item 5, "Control of the Work." Failure to meet a PRP to the Engineer's satisfaction may result in immediate referral to the Performance Review Committee for consideration of further action against the Contractor.

The Engineer will consider and document any events outside the Contractor's control that contributed to the failure to meet performance standards or comply with a PRP, including consideration of sufficient time.

Follow the escalation ladder if there is a disagreement regarding an evaluation or disposition of a PRP. The Contractor may submit additional documentation pertaining to the dispute. The District Engineer's decision

on a Contractor's evaluation score and recommendation of action required in a PRP or follow up for non-compliance is final.

4. DIVISION OVERSIGHT

Upon request of the Construction or Maintenance Division, develop and submit for Division approval a proposed CAP to document expectations for correcting deficiencies in the performance of projects statewide.

Comply with the CAP as directed. The CAP may be modified at any time up to completion or resolution after written approval of the premise of change from the Division. Failure to meet an adopted or revised adopted CAP to the Division's satisfaction within 120 days will result in immediate referral to the Performance Review Committee for consideration of further action against the Contractor.

The Division will consider and document any events outside the Contractor's control that contributed to the failure to meet performance standards or comply with a CAP, including consideration of sufficient time and associated costs as appropriate.

5. PERFORMANCE REVIEW COMMITTEE

The Performance Review Committee, in accordance with 43 TAC §9.24, will review at minimum all final evaluations, history of compliance with PRPs, any adopted CAPs including agreed modifications, any information about events outside a Contractor's control contributing to the Contractor's performance, and any documentation submitted by the Contractor and may recommend one or more of the following actions:

- take no action,
- reduce the Contractor's bidding capacity,
- prohibit the Contractor from bidding on one or more projects,
- immediately suspend the Contractor from bidding for a specified period of time, by reducing the Contractor's bidding capacity to zero, or
- prohibit the Contractor from being awarded a Contract on which they are the apparent low bidder.

The Deputy Executive Director will determine any further action against the Contractor.

6. APPEALS PROCESS

In accordance with 43 TAC §9.25, the Contractor may appeal remedial actions determined by the Deputy Executive Director.

Special Provision 000

Certificate of Interested Parties (Form 1295)

Submit a Form 1295, "Certificate of Interested Parties," in the following instances:

- at contract execution for contracts awarded by the Mobility Authority;
- at any time there is an increase of \$300,000 or more to an existing contract (change orders, extensions, and renewals); or
- at any time there is a change to the information in Form 1295, when the form was filed for an existing contract.

Form 1295 and instructions on completing and filing the form are available on the Texas Ethics Commission website.

Special Provision to Item 000

Schedule of Liquidated Damages



The dollar amount of daily contract administration Liquidated Damages per Working Day is \$

In addition to the amount shown above, the Liquidated Damages will be increased by the amount shown in Item 8 of the General Notes for Road User Cost (RUC), when applicable.

Special Provision to Item 1

Abbreviations and Responsibilities

Item 1, "Abbreviations and Definitions," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 1. is supplemented with the following:

1.0. General Statement:

For this Contract, the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges, November 1, 2014 (the "Texas Standard Specifications"), all documents referenced therein, and all manuals, bulletins, supplements, specifications, and similar materials issued by the Texas Department of Transportation ("TxDOT"), or any predecessor or successor thereto, which are applicable to this Contract, are hereby modified with respect to the terms cited below and no others are changed hereby.

The term "State", "State of Texas", "State Highway Agency", "State Highway Department Of Texas", "State Department of Highways and Public Transportation", "Texas State Department Of Highways and Public Transportation", "Texas Department of Transportation", "Department", "Texas Turnpike Authority", "State Department of Highways and Public Transportation Commission", "Texas Department of Transportation Commission", "Texas Transportation Commission", or "State Highway Commission", shall, in the use of The Texas Standard Specifications, Special Provisions and Special Specifications and General Notes and Specification Data pertaining thereto, and required contract provisions for Federal-Aid construction contracts, for all work in connection with Central Texas Regional Mobility Authority, projects and all extensions enlargements, expansions, improvements, and rehabilitations thereto, be deemed to mean Central Texas Regional Mobility Authority, unless the context clearly indicates a contrary meaning.

Article 2, "Abbreviations," is supplemented with the following:

CTRMA Central Texas Regional Mobility Authority

Article 3.28., "Commission", is voided and replaced by the following:

3.28. Commission. The Central Texas Regional Mobility Authority Board or authorized representative.

Article 3.32., "Construction Contract", is voided and replaced by the following:

3.32. Construction Contract. The agreement between the Central Texas Regional Mobility Authority and the Contractor establishing the obligations of the parties for furnishing of materials and performance of the work prescribed in the Contract Documents.

Article 3.45., "Debar (Debarment)", is voided and replaced by the following:

3.45. Debar (Debarment). Action taken by the Mobility Authority, federal government or state government pursuant to regulation that prohibits a person or company from entering into a Contract, or from participating as a subcontractor, or supplier of materials or equipment used in a highway improvement Contract as defined in Transportation Code, Chapter 223, Subchapter A.

Article 3.47., "Department", is voided and replaced by the following:

3.47. Department. Central Texas Regional Mobility Authority, unless the context clearly indicates a contrary intent and meaning.

Article 3.48., "Departmental Material Specifications", is voided and replaced by the following:

3.48. Departmental Material Specifications (DMS). Reference specifications for various materials published by the Texas Department of Transportation Construction Division.

Article 3.54., "Engineer", is hereby deleted and replaced by the following:

3.54 Engineer. The Central Texas Regional Mobility Authority Coordinator or their duly authorized representative.

Article 3.73., "Letting Official", is hereby deleted and replaced by the following:

3.73. Letting Official. An employee of the Central Texas Regional Mobility Authority empowered by the Central Texas Regional Mobility Authority to officially receive bids and close the receipt of bids at a letting.

Article 3.79., "Manual of Testing Procedures", is voided and replaced by the following:

3.79. Manual of Testing Procedures. Texas Department of Transportation manual outlining test methods and procedures maintained by the Materials and Pavements Section of the Construction Division.

Article 3.102., "Proposal Form", is voided and replaced by the following:

3.012. Proposal Form. The document issued by the Central Texas Regional Mobility Authority for a proposed Contract that includes:

- the specific locations (except for non-site-specific work) and description of the proposed work;
- an estimate of the various quantities and kinds of work to be performed or materials to be furnished;
- a schedule of items for which unit prices are requested;
- the number of working days within which the work is to be completed (or reference to the requirements); and
- the special provisions and special specifications applicable to the proposed Contract.

Article 3.108., "Referee Tests", is voided and replaced by the following:

3.108. Referee Tests. Tests requested to resolve differences between Contractor and Engineer test results. The referee laboratory is the Texas Department of Transportation Construction Division Materials and Pavement Section, or mutually agreed to 3rd party commercial laboratory.

Article 3.129., "State", is voided and replaced by the following:

3.129. State. Central Texas Regional Mobility Authority.

3.156. Mobility Authority. The Central Texas Regional Mobility Authority, an agency created under Texas Transportation Code Chapter 370 and approved by the Texas Transportation Commission, together with its members, partners, employees, agents officers, directors, shareholders, representatives, consultants, successors, and assigns. The Mobility Authority's principal office is presently located at 3300 N. I-35, Suite 300, Austin, Texas 78705.

3.157. Bid Form. The form provided by the Mobility Authority used by the bidder to submit a bid. Electronic bid forms for the project shall be submitted via the project's CivCast website.

3.158. Full Completion of all Work (or to Fully Complete all Work). The completion of all work specified under this Contract as evidenced by the Formal Acceptance thereof by the Mobility Authority.

3.159. Standards. Whenever the Plans and/or Specifications refer to "Standard Sheets" or "Design Details" such reference shall be construed to mean the set of drawings issued by the Design Divisions, Texas Department of Transportation, and entitled "Standard Sheets". Only those standards or standard drawings specifically referred to by number on the Plans or in the various Contract Documents are applicable to work on this Contract.

Whenever in the various Contract Documents term, "Department" or "State" appears, it shall be replaced by the term, "Central Texas Regional Mobility Authority." Similarly, the term, "Executive Director" shall be replaced by the term, "Central Texas Regional Mobility Authority Coordinator".

Whenever in the Texas Department of Transportation Specifications and Standard Drawings the term, "Department" or "Texas Department of Transportation" appears, it shall be replaced by the term, "Central Texas Regional Mobility Authority," except in references to said Texas Department of Transportation as being the author of certain Specifications and Standard Drawings, and in reference to said Department as the agency prequalifying prospective Bidders.

Whenever in the Texas Department of Transportation Specifications and Standard Drawing the term, "District Engineer" appears, it shall be replaced by the term, "Central Texas Regional Mobility Authority Coordinator".

3.160. Substantial Completion. Substantial Completion shall be defined as occurring when all of the following conditions are met:

- All project work requiring lane or shoulder closures or obstructions is completed, and traffic is utilizing the lane arrangement as shown on the plans for the finished roadway.
- All signs, traffic control devices, and pavement markings are in their final position at this time.
- All sidewalks are opened for public use.

3.161. Provisional Award. Award given by the Mobility Authority to the Contractor after the Board of Directors approves the contract and is contingent on TxDOT approval. The Contractor is not required to provide bonds, insurance or their SBE Commitment Agreement Form.

Special Provision to Item 2

Instructions to Bidders

Item 2, "Instructions to Bidders" of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

Article 2.3., "Issuing Proposal Forms," first two sentences are replaced with the following:

Mobility Authority will issue an Official Bid Form to a prequalified Bidders. The online bid form will be made available to the prequalified bidders on the CivcastUSA website: <https://www.civcastusa.com/project/6227d063ce70832257d9e630/summary>

Prequalification requirements:

- Be registered with State of Texas,
- Be fully prequalified by Texas Department of Transportation (TxDOT),
- Have a bidding capacity per TxDOT prequalification system of \$1,000,000,
- Email a valid Non-Collusion Affidavit, Debarment Affidavit, and Child Support Statement to Allen.Yu@atkinsglobal.com and Carlos.Sepulveda@atkinsglobal.com and include a phone number, email address and physical address for point of contact.

Article 2.3., "Issuing Proposal Forms," is supplemented by the following:

The Department may not issue a proposal form if one or more of the following apply:

- The Contractor has been defaulted in accordance with Article 8.7., "Default of Contract" (a default for performance) on a previous Contract with the Department within the last 3 years
- The Contractor is not in compliance with Texas Government Code Sections 2155.089 and 2262.055.

Special Provision to Item 2

Instructions to Bidders



Item 2, "Instructions to Bidders," of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

Article 2.3., "Issuing Proposal Forms," is supplemented by the following:

- the Bidder or affiliate of the Bidder that was originally determined as the apparent low Bidder on a project, but was deemed nonresponsive for failure to register or participate in the Department of Homeland Security's (DHS) E-Verify system as specified in Article 2.15., "Department of Homeland Security (DHS) E-Verify System," is prohibited from rebidding that specific project.

Article 2.7., "Nonresponsive Bid," is supplemented by the following:

- the Bidder failed to participate in the Department of Homeland Security's (DHS) as specified in Article 2.15., "Department of Homeland Security (DHS) E-Verify System."

Article 2.15., "Department of Homeland Security (DHS) E-Verify System," is added.

The Department will not award a Contract to a Contractor that is not registered in the DHS E-Verify system. Remain active in E-Verify throughout the life of the contract. In addition, in accordance with paragraph six of Article 8.2, "Subcontracting," include this requirement in all subcontracts and require that subcontractors remain active in E-Verify until their work is completed.

If the apparent low Bidder does not appear on the DHS E-Verify system prior to award, the Department will notify the Contractor that they must submit documentation showing that they are compliant within 5-business days after the date the notification was sent. A Contractor who fails to comply or respond within the deadline will be declared non-responsive and the Department will execute the proposal guaranty. The proposal guaranty will become the property of the State, not as a penalty, but as liquidated damages. The Bidder forfeiting the proposal guaranty will not be considered in future proposals for the same work unless there has been a substantial change in the scope of the work.

The Department may recommend that the Commission:

- reject all bids, or
- award the Contract to the new apparent low Bidder, if the Department is able to verify the Bidder's participation in the DHS E-verify system. For the Bidder who is not registered in E-Verify, the Department will allow for one business day after notification to provide proof of registration.

If the Department is unable to verify the new apparent low Bidder's participation in the DHS E-Verify system within one calendar day:

- the new apparent low Bidder will not be deemed nonresponsive,
- the new apparent low Bidder's guaranty will not be forfeited,
- the Department will reject all bids, and
- the new apparent low Bidder will remain eligible to receive future proposals for the same project.

Special Provision to Item 3

Award and Execution of Contract

Item 3, "Award and Execution of Contract" of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

Article 1, "Award of Contract," is deleted in its entirety and replaced with the following:

The Mobility Authority will award or reject the Contract within 60 calendar days after the opening of the proposal at the sole discretion of the Mobility Authority.

Article 4.3., "Insurance," is supplemented by the following:

The Contractor shall be the named insured, and the following entities shall be additional insureds on a primary and non-contributory basis: Central Texas Regional Mobility Authority, Texas Department of Transportation.

These entities shall be additional insureds to this policy with respect to liability arising out of the acts, errors, and omissions of any member of the Contractor and Subcontractors whether occurring on or off of the site, notwithstanding any other provisions of the Contract Documents, the project policy shall not be canceled, except for non-payment of premium, fraud, material misrepresentation, or noncompliance with reasonable loss control recommendations.

The Authority Board, the Authority, Texas Department of Transportation, the State of Texas, the Commission and their respective successors, assigns, officeholders, officers, directors, commissioners, consultants and employees shall be listed as "additional insureds" with respect to any insurance for which the contractor must obtain an "additional insured" rider or amendment.

Table 2 is deleted in its entirety and replaced with the following:

Type of Insurance	Amount of Coverage
Commercial General Liability Insurance	Including products/completed operations liability and contractual liability , in the amount of \$1,000,000 per occurrence for bodily injury and property damage
Business Automobile Policy	In the amount of \$1,000,000 per occurrence for bodily injury and property damage
Workers' Compensation	Providing statutory benefits, and Employers Liability with limits of \$1,000,000
Excess Liability Insurance	In the amount of \$5,000,000 per occurrence and aggregate

Special Provision to Item 3 Award and Execution Contract



Item 3, Award and Execution of Contract," of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

Section 4.3, "Insurance." The first sentence is voided and replaced by the following:

For construction and building Contracts, submit a certificate of insurance showing coverages in accordance with Contract requirements. For routine maintenance Contracts, refer to Article 8, "Beginning of Work."

Article 8, "Beginning of Work." The first sentence is supplemented by the following:

For a routine maintenance Contract, do not begin work until a certificate of insurance showing coverages in accordance with the Contract requirements is provided and accepted.

Special Provision to Item 4

Scope of Work

Item 4, "Scope of Work," of the Standard Specifications, is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

Article 4.4., "Changes in the Work," Delete the following paragraph:

"If the changes in quantities or the alternations do not significantly change the character of the work under the Contract, the altered work will be paid for at the Contract unit price. If the changes in quantities or the alterations significantly change the character of the work, the Contract will be amended by a change order. If no unit price exists, this will be considered extra work and the Contract will be amended by a change order. Provide cost justification as requested, in an acceptable format. Payment will not be made for anticipated profits on work that is eliminated."

and replace with the following:

"The Engineer may require deviations to the Work through a written directive. Payment for the deviations and quantity overruns will be made through the Contingency Allowance. Deviations and quantity overruns will be paid for at the unit prices submitted at the bidding stage. Deviations requiring new unit prices will be negotiated and made through the Contingency Allowance. Costs exceeding the Contingency Allowance will be addressed using the change order process.

Upon completion of the Work, the total contract value will be adjusted to provide for the difference, if any, between the total amount of expenditures from the Contingency Allowance and the original amount of the Contingency Allowance. The Contractor is not entitled to all or any part of an unexpended balance of the Contingency Allowance.

When changes are made that do not fall under the Contingency Allowance, the Contract will be amended by a Change Order. Provide cost justification as requested, in an acceptable format. Payment will not be made for anticipated profits on work that is eliminated."

Article 4.6., "Requests for Additional Compensation and Damages," is supplemented by the following:

"Contractor shall not be eligible for Change Order(s) for additional compensation for additional costs, including costs for developing and executing a Recovery Schedule(s), and delay and disruption damages, or additional Days incurred directly or indirectly from the virus known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and the disease known as COVID-19, including any disruptions to, and delays or interruptions in, construction of the Project in accordance with the Contract and any approved Baseline Schedule."

Special Provision to Item 5

Control of the Work



Item 5, "Control of the Work," of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

Article 5.1, "Authority of Engineer," is voided and replaced by the following.

The Engineer has the authority to observe, test, inspect, approve, and accept the work. The Engineer decides all questions about the quality and acceptability of materials, work performed, work progress, Contract interpretations, and acceptable Contract fulfillment. The Engineer has the authority to enforce and make effective these decisions.

The Engineer acts as a referee in all questions arising under the terms of the Contract. The Engineer's decisions will be final and binding.

The Engineer will pursue and document actions against the Contractor as warranted to address Contract performance issues. Contract remedies include, but are not limited to, the following:

- conducting interim performance evaluations requiring a Project Recovery Plan, in accordance with Title 43, Texas Administrative Code (TAC) §9.23,
- requiring the Contractor to remove and replace defective work, or reducing payment for defective work,
- removing an individual from the project,
- suspending the work without suspending working day charges,
- assessing standard liquidated damages to recover the Department's administrative costs, including additional project-specific liquidated damages when specified in the Contract in accordance with 43 TAC §9.22,
- withholding estimates,
- declaring the Contractor to be in default of the Contract, and
- in case of a Contractor's failure to meet a Project Recovery Plan, referring the issue directly to the Performance Review Committee for consideration of further action against the Contractor in accordance with 43 TAC §9.24.

The Engineer will consider and document any events outside the Contractor's control that contributed to the failure to meet performance standards, including consideration of sufficient time.

Follow the issue escalation ladder if there is disagreement regarding the application of Contract remedies.

Special Provision to Item 5

Control of the Work



Item 5, "Control of the Work" of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

Article 5.4, "Coordination of Plans, Specifications, and Special Provisions," the last sentence of the last paragraph is replaced by the following:

Failure to promptly notify the Engineer will constitute a waiver of all contract claims against the Department for misunderstandings or ambiguities that result from the errors, omissions, or discrepancies.

Special Provision to Item 6

Control of Materials

For this project, Item 6, "Control of Materials," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 1., "Source Control," is supplemented by the following:

The use of convict-produced materials is prohibited per 23 CFR 635.417.

There shall be no local preference for the purchasing of materials.

Article 4., "Sampling, Testing, and Inspection," is supplemented by the following:

Quality Control testing of all materials, construction items, or products incorporated in the work shall be performed by the Contractor according to the contract specifications at the Contractor's expense.

Quality Assurance sampling and testing for acceptance will be performed by the Mobility Authority's Construction Representative/Observer in accordance with the Quality Control (QC) / Quality Assurance (QA) program outlined in the Quality Assurance Plan (QAP). The cost of such tests will be incurred by the Mobility Authority and coordinated by the Mobility Authority's Construction Representative/Observer through funds made available to the Construction Representative/Observer under his/her agreement with the Mobility Authority for the professional services related to construction engineering and inspection on the Project.

Special Provision to Item 6

Control of Materials



Item 6, "Control of Materials" of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

Article 6.10., "Hazardous Materials," is voided and replaced by the following:

Comply with the requirements of Article 7.12., "Responsibility for Hazardous Materials."

Notify the Engineer immediately when a visual observation or odor indicates that materials on sites owned or controlled by the Department may contain hazardous materials. Except as noted herein, the Department is responsible for testing, removing, and disposing of hazardous materials not introduced by the Contractor. The Engineer may suspend work wholly or in part during the testing, removing, or disposing of hazardous materials, except in the case where hazardous materials are introduced by the Contractor.

Use materials that are free of hazardous materials. Notify the Engineer immediately if materials are suspected to contain hazardous materials. If materials delivered to the project by the Contractor are suspected to contain hazardous materials, have an approved commercial laboratory test the materials for the presence of hazardous materials as approved. Remove, remediate, and dispose of any of these materials found to contain hazardous materials. The work required to comply with this section will be at the Contractor's expense if materials are found to contain hazardous materials. Working day charges will not be suspended and extensions of working days will not be granted for activities related to handling hazardous material introduced by the Contractor. If suspected materials are not found to contain hazardous materials, the Department will reimburse the Contractor for hazardous materials testing and will adjust working day charges if the Contractor can show that this work impacted the critical path.

10.1. Painted Steel Requirements. Coatings on existing steel contain hazardous materials unless otherwise shown on the plans. Remove paint and dispose of steel coated with paint containing hazardous materials in accordance with the following:

10.1.1. Removing Paint From Steel For contracts that are specifically for painting steel, Item 446, "Field Cleaning and Painting Steel" will be included as a pay item. Perform work in accordance with that item.

For projects where paint must be removed to allow for the dismantling of steel or to perform other work, the Department will provide for a separate contractor (third party) to remove paint containing hazardous materials prior to or during the Contract. Remove paint covering existing steel shown not to contain hazardous materials in accordance with Item 446, "Field Cleaning and Painting Steel."

10.1.2. Removal and Disposal of Painted Steel. For steel able to be dismantled by unbolting, paint removal will not be performed by the Department. The Department will remove paint, at locations shown on the plans or as agreed, for the Contractor's cutting and dismantling purposes. Utilize Department cleaned locations for dismantling when provided or provide own means of dismantling at other locations.

Painted steel to be retained by the Department will be shown on the plans. For painted steel that contains hazardous materials, dispose of the painted steel at a steel recycling or smelting facility unless otherwise shown on the plans. Maintain and make available to the Engineer invoices and other records obtained from the facility showing the received weight of the steel and the facility name. Dispose of steel that does not contain hazardous material coatings in accordance with federal, state and local regulations.

10.2. Asbestos Requirements. The plans will indicate locations or elements where asbestos containing materials (ACM) are known to be present. Where ACM is known to exist or where previously unknown ACM has been found, the Department will arrange for abatement by a separate contractor prior to or during the Contract. Notify the Engineer of proposed dates of demolition or removal of structural elements with ACM at least 60 days before beginning work to allow the Department sufficient time for abatement.

The Department of State Health Services (DSHS), Asbestos Programs Branch, is responsible for administering the requirements of the National Emissions Standards for Hazardous Air Pollutants, 40 CFR Part 61, Subpart M and the Texas Asbestos Health Protection Rules (TAHPR). Based on EPA guidance and regulatory background information, bridges are considered to be a regulated "facility" under NESHAP. Therefore, federal standards for demolition and renovation apply.

The Department is required to notify the DSHS at least 10 working days (by postmarked date) before initiating demolition or renovation of each structure or load bearing member shown on the plans. If the actual demolition or renovation date is changed or delayed, notify the Engineer in writing of the revised dates in sufficient time to allow for the Department's notification to DSHS to be postmarked at least 10 days in advance of the actual work.

Failure to provide the above information may require the temporary suspension of work under Article 8.4., "Temporary Suspension of Work or Working Day Charges," due to reasons under the control of the Contractor. The Department retains the right to determine the actual advance notice needed for the change in date to address post office business days and staff availability.

10.3. Lead Abatement. Provide traffic control as shown on the plans, and coordinate and cooperate with the third party and the Department for managing or removing hazardous materials. Work for the traffic control shown on the plans and coordination work will not be paid for directly but will be subsidiary to pertinent Items.

Special Provision to Item 7

Legal Relations and Responsibilities

Item 7, "Legal Relations and Responsibilities" of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

Article 7.3., "Laws To Be Observed", Article 7.5., "Patented Devices", Article 7.12., "Responsibility For Hazardous Materials", and Article 7.15., "Responsibility For Damage Claims", "State" is voided and replaced by "Central Texas Regional Mobility Authority and TxDOT".

Article 7.3., "Laws To Be Observed," is supplemented by the following:

By entering into Contract, the Contractor agrees to provide or make available to the Department records, including electronic records related to the Contract for a period of 3 years after the final payment. No person or entity other than TxDOT may claim third -party beneficiary status under this Contract or any of its provisions, nor may any non-party sue for personal injuries or property damage under this Contract.

Article 7.15., "Responsibility For Damage Claims," the last paragraph is deleted and not replaced.

Special Provision to Item 7

Legal Relations and Responsibilities



Item 7, "Legal Relations and Responsibilities," of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

Section 7.7.2., "Texas Pollutant Discharge Elimination System (TPDES) Permits and Storm Water Pollution Prevention Plans (SWP3)," is voided and replaced by the following:

7.2. Texas Pollution Discharge Elimination System (TPDES) Permits and Storm Water Pollution Prevention Plans (SWP3).

7.2.1. Projects with less than one acre of soil disturbance including required associated project specific locations (PSL's) per TPDES GP TXR 150000.

No posting or filing will be required for soil disturbances within the right of way. Adhere to the requirements of the SWP3.

7.2.2. Projects with one acre but less than five acres of soil disturbance including required associated PSL's per TPDES GP TXR 150000.

The Department will be considered a primary operator for Operational Control Over Plans and Specifications as defined in TPDES GP TXR 150000 for construction activity in the right of way. The Department will post a small site notice along with other requirements as defined in TPDES GP TXR 150000 as the entity of having operational control over plans and specifications for work shown on the plans in the right of way.

The Contractor will be considered a Primary Operator for Day-to-Day Operational Control as defined in TPDES GP TXR 150000 for construction activity in the right of way. In addition to the Department's actions, the Contractor will post a small site notice along with other requirements as defined in TPDES GP TXR 150000 as the entity of having day-to-day operational control of the work shown on the plans in the right of way. This is in addition to the Contractor being responsible for TPDES GP TXR 150000 requirements for on- right of way and off- right of way PSL's. Adhere to all requirements of the SWP3 as shown on the plans. The Contractor will be responsible for Implement the SWP3 for the project site in accordance with the plans and specifications, TPDES General Permit TXR150000, and as directed.

7.2.3. Projects with 5 acres or more of soil disturbance including required associated PSL's per TPDES GP TXR 150000.

The Department will be considered a primary operator for Operational Control Over Plans and Specifications as defined in TPDES GP TXR 150000 for construction activities in the right of way. The Department will post a large site notice, file a notice of intent (NOI), notice of change (NOC), if applicable, and a notice of termination (NOT) along with other requirements per TPDES GP TXR 150000 as the entity having operational control over plans and specifications for work shown on the plans in the right of way.

The Contractor will be considered a primary operator for Day-to-Day Operational Control as defined in TPDES GP TXR 150000 for construction activities in the right of way. In addition to the Department's actions, the Contractor shall file a NOI, NOC, if applicable, and NOT and post a large site notice along with other requirements as the entity of having day-to-day operational control of the work shown on the plans in the right of way. This is in addition to the Contractor

being responsible for TPDES GP TXR 150000 requirements for on- right of way and off- right of way PSL's. Adhere to all requirements of the SWP3 as shown on the plans.

Special Provision to Item 007

Legal Relations and Responsibilities



Item 7, "Legal Relations and Responsibilities," of the Standard Specifications is amended with respect to the clauses cited below.

Section 2.6., "Barricades, Signs, and Traffic Handling," the first paragraph is voided and replaced by the following:

- 2.6. **Barricades, Signs, and Traffic Handling.** Comply with the requirements of Item 502 "Barricades, Signs, and Traffic Handling," and as directed. Provide traffic control devices that conform to the details shown on the plans, the TMUTCD, and the Department's Compliant Work Zone Traffic Control Device List maintained by the Traffic Safety Division. When authorized or directed, provide additional signs or traffic control devices not required by the plans.

Section 2.6.1., "Contractor Responsible Person and Alternative," is voided and replaced by the following:

- 2.6.1. **Contractor Responsible Person and Alternative.** Designate in writing, a Contractor's Responsible Person (CRP) and an alternate to be the representative of the Contractor who is responsible for taking or directing corrective measures regarding the traffic control. The CRP or alternate must be accessible by phone 24 hr. per day and able to respond when notified. The CRP and alternate must comply with the requirements of Section 2.6.5., "Training."

Section 2.6.2, "Flaggers," the first paragraph is voided and replaced by the following:

- 2.6.2. **Flaggers.** Designate in writing, a flagger instructor who will serve as a flagging supervisor and is responsible for training and assuring that all flaggers are qualified to perform flagging duties. Certify to the Engineer that all flaggers will be trained and make available upon request a list of flaggers trained to perform flagging duties.

Section 2.6.5, "Training," is voided and replaced by the following:

- 2.6.5. **Training.** Train workers involved with the traffic control using Department-approved training as shown on the "Traffic Control Training" Material Producer List.

Coordinate enrollment, pay associated fees, and successfully complete Department-approved training or Contractor-developed training. Training is valid for the period prescribed by the provider. Except for law enforcement personnel training, refresher training is required every 4 yr. from the date of completion unless otherwise specified by the course provider. The Engineer may require training at a frequency instead of the period prescribed based on the Department's needs. Training and associated fees will not be measured or paid for directly but are considered subsidiary to pertinent Items.

Certify to the Engineer that workers involved in traffic control and other work zone personnel have been trained and make available upon request a copy of the certification of completion to the Engineer. Ensure the following is included in the certification of completion:

- name of provider and course title,
- name of participant,
- date of completion, and
- date of expiration.

Where Contractor-developed training or a Department-approved training course does not produce a certification, maintain a log of attendees. Make the log available upon request. Ensure the log is legible and includes the following:

- printed name and signature of participant,
- name and title of trainer, and
- date of training.

2.6.5.1. **Contractor-developed Training.** Develop and deliver Contractor-developed training meeting the minimum requirements established by the Department. The outline for this training must be submitted to the Engineer for approval at the preconstruction meeting. The CRP or designated alternate may deliver the training instead of the Department-approved training. The work performed and materials furnished to develop and deliver the training will not be measured or paid for directly but will be considered subsidiary to pertinent Items.

2.6.5.1.1. **Flagger Training Minimum Requirements.** A Contractor's certified flagging instructor is permitted to train other flaggers.

2.6.5.1.2. **Optional Contractor-developed Training for Other Work Zone Personnel.** For other work zone personnel, the Contractor may provide training meeting the curriculum shown below instead of Department-approved training.

Minimum curriculum for Contractor-provided training is as follows:

Contractor-developed training must provide information on the use of personnel protection equipment, occupational hazards and health risks, and other pertinent topics related to traffic management. The type and amount of training will depend on the job duties and responsibilities. Develop training applicable to the work being performed. Develop training to include the following topics.

- The Life You Save May Be Your Own (or other similar company safety motto).
- Purpose of the training.
 - It's the Law.
 - To make work zones safer for workers and motorist.
 - To understand what is needed for traffic control.
 - To save lives including your own.
- Personal and Co-Worker Safety.
 - **High Visibility Safety Apparel.** Discuss compliant requirements; inspect regularly for fading and reduced reflective properties; if night operations are required, discuss the additional and appropriate required apparel in addition to special night work risks; if moving operations are underway, discuss appropriate safety measures specific to the situation and traffic control plan.
 - **Blind Areas.** A blind area is the area around a vehicle or piece of construction equipment not visible to the operators, either by line of sight or indirectly by mirrors. Discuss the "Circle of Safety" around equipment and vehicles; use of spotters; maintain eye contact with equipment operators; and use of hand signals.
 - **Runovers and Backovers.** Remain alert at all times; keep a safe distance from traffic; avoid turning your back to traffic and if you must then use a spotter; and stay behind protective barriers, whenever possible. Note: It is not safe to sit on or lean against a concrete barrier, these barriers can deflect four plus feet when struck by a vehicle.
 - Look out for each other, warn co-workers.
 - Be courteous to motorists.
 - Do not run across active roadways.
 - Workers must obey traffic laws and drive courteously while operating vehicles in the work zones.
 - Workers must be made aware of company distracted driving policies.
- **Night Time Operations.** Focus should be placed on projects with a nighttime element.

- **Traffic Control Training.** Basics of Traffic Control.
 - Identify work zone traffic control supervisor and other appropriate persons to report issues to when they arise.
 - Emphasize that work zone traffic control devices must be in clean and in undamaged condition. If devices have been hit but not damaged, put back in their correct place and report to traffic control supervisor. If devices have been damaged, replace with new one and report to traffic control supervisor. If devices are dirty, faded or have missing or damaged reflective tape clean or replace and report to traffic control supervisor. Show examples of non-acceptable device conditions. Discuss various types of traffic control devices to be used and where spacing requirements can be found.
 - **Channelizing Devices and Barricades with Slanted Stripes.** Stripes are to slant in the direction you want traffic to stay or move to; demonstrate this with a device.
 - **Traffic Queuing.** Workers must be made aware of traffic queuing and the dangers created by it. Workers must be instructed to immediately notify the traffic control supervisor and other supervisory personnel if traffic is queuing beyond advance warning sign and devices or construction limits.
 - **Signs.** Signs must be straight and not leaning. Report problems to the traffic control supervisor or other as designated for immediate repair. Covered signs must be fully covered. If covers are damaged or out of place, report to traffic control supervisor or other as designated.

Special Provision to Item 8

Prosecution and Progress

Item 8, "Prosecution and Progress," of the Standard Specifications, is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

Article 8.5., "Project Schedules" is supplemented by the following

The progress schedule required for this project is the critical path method schedule (CPM schedule) as described herein. The Contractor shall prepare and submit for review and acceptance a cost loaded schedule of proposed working progress for the entire contract duration. The Engineer will provide a template with milestones from other contracts and non-construction activities for the Contractor to use in the development of their schedule. The Engineer shall also provide a Work Breakdown Structure (WBS) as well as the required report layouts for the Contractor to use to develop the progress schedule for this Contract.

Immediately after receipt of notice of award, the Division Engineer and the Contractor will establish a mutually agreeable date on which the preconstruction meeting will be held. The Contractor's project superintendent and other individuals representing the Contractor who are knowledgeable of the Contractor's proposed progress schedule or who will be in charge of major items of the work shall attend the preconstruction conference.

After work on the project has begun, construction conferences will be held periodically. The construction conferences are to be scheduled at times that are mutually agreeable to both the project superintendent and the Resident Engineer. It shall be the superintendent's responsibility to attend the conferences.

Section 8.5.2 "Progress Schedule" is supplemented by the following:

The Contractor shall provide a schedule that shows the various activities of Work in sufficient detail to demonstrate a reasonable and workable plan to complete the Project by the Original Contract Completion Date and any interdependent milestones identified by the Engineer or required by Contract. Show the order and interdependence of activities and the sequence for accomplishing the Work. Describe all activities in sufficient detail so that the Engineer can readily identify the Work and measure the progress of each activity.

Section 8.5.3 "Schedule Format" is supplemented by the following:

The Contractor shall use a compatible version of Oracle Primavera P6 or comparable scheduling software to generate the CPM schedule. It is the Contractor's responsibility to verify with the Engineer the software and version being used for this project and shall maintain the required version for the entire contract duration. The use of Microsoft Project and Primavera Project Planner (P3) and other scheduling software is prohibited.

The progress schedule shall contain the following Administrative Identifier Information:

- (1) Project Name
- (2) Contract Number
- (3) Date of Contract
- (4) Construction Completion Date
- (5) Contractor's Name
- (6) Contractor's Contact Information

The CPM schedule must reflect the scope of work and include the following:

- (1) Clear identification of tasks to be completed based on Section or Special Provisions included in the Project Manual and as listed in Pay Items, including subcontractor work activities.
- (2) Include calculations of resources required (Cost, Labor, Equipment) for constructing all facilities within the Contract duration. Specific calculations shall be provided to show quantities, manpower / crews, and equipment to support the critical path. The Contractor shall be capable of calculating the maximum crew size anticipated if any activities become critical, so the Contractor is prepared when a critical path changes or a new path occurs.
- (3) Float for each Activity.
- (4) Activities for submittals (shop drawings).
- (5) Punchlist activities with sufficient duration for the Engineer's inspection and acceptance before the final completion date
- (6) Activities for submittal review time by the Engineer, including time range showing start and end dates.
- (7) Working and shop drawing preparation, submittal, and review for acceptance.
- (8) Material and equipment procurement, fabrication and delivery; identify any long lead items as separate activities.
- (9) Owner furnished and/or installed materials and equipment shall be identified as separate activities.
- (10) NTP / Start of construction
- (11) Required phasing
- (12) Maintenance of traffic requirements as required by the contract (if any)
- (13) Intermediate completion dates (if any)
- (14) Identified interdependent milestones (if any)
- (15) Seasonal limitation/observation periods/moratoriums
- (16) Beginning and end of each traffic control work area and road openings
- (17) Other similar activities and project milestones established in the Contract Documents.
- (18) Substantial Completion Date
- (19) Final Acceptance Date
- (20) All required Reports layouts as requested by the Engineer

Section 8.5.4 "Activity Format" is supplemented by the following:

Activity requirements are discussed in further detail as follows:

- (1) Activity Identification (ID) - Assign each activity a unique identification number. The format for the identification number will be provided by the Engineer. All activities must begin with the same activity ID prefix as provided by the Engineer.
- (2) Activity Description - Assign each activity an unambiguous descriptive word or phrase. For example, use "Excavate Area A," not "Start Excavation."
- (3) Activity Codes – The Engineer will provide the activity code dictionary in the template. The Contractor will assign the appropriate codes to each activity.
- (4) Activity Original Duration - Assign a planned duration in working days for each activity. Do not exceed a duration of 10 working days for any activity unless accepted by the Engineer. Each activity shall have a minimum duration of 1 working day. Do not represent the maintenance of traffic, erosion control, and other similar items as single activities extending to the Completion Date. Break these Contract Items into component activities in order to meet the duration requirements of this paragraph.
- (5) Finish-to-Start Relationships - Unless allowed in writing by the Engineer, use only finish-to-start relationships with no leads or lags to link activities. All activities, except the first activity, shall have a predecessor(s). All activities, except the final activity, shall have a successor(s).
- (6) Calendars – The Engineer will provide pre-defined calendars as part of the template. The Contractor shall assign these pre-defined calendars to the appropriate activities. The Contractor may create new projectspecific

- calendars to represent their standard work schedule using the pre-defined calendars as a basis. The Contractor may not edit pre-defined calendars.
- (7) Constraints – Unless allowed in writing by the Engineer, do not use constraints in the schedule.
 - (8) Resources – Manpower and equipment shall be reflected for all activities. Incidental costs to construction shall be equally spread out across all activities. Front loaded schedules are not allowed.
 - (9) The schedule shall show the total cost of performing each activity and shall include the total labor, material, equipment and general conditions.
 - (10) The sum of cost for all activities shall equal the total Contract.
 - (11) The summed value of that portion of the activities allocated to each Contract bid item shall equal the total value of the corresponding Contract bid item.
 - (12) The Contractor shall allocate a value for unit price or lump sum contract bid items to each activity in the schedule. No Lump sum amounts should exceed \$100,000.

Section 8.5.5.2 “Critical Path Method” The first paragraph is voided and replaced by the following:

The Contractor shall submit the baseline CPM schedule in a bar chart format showing the critical path in red, using both hard copy and in electronic formats. Electronic formats shall be compatible with the Engineer’s computer systems. Also, submit the following information:

- (1) Written narrative – Explains the sequence of work, the controlling operations, intermediate completion dates, milestones, project phasing, anticipated work schedule and estimated resources. In addition, explain how permit requirements, submittal tracking and coordination with subcontractors, utility companies, railroads and other third party entities will be performed. The narrative shall itemize and describe the critical path (i.e. access limitations, constraints, shift work), and compare early and late date or Contract Milestone activities, and describe any critical resources.
- (2) CPM Schedule in a Bar Chart Format – Include the Administrative Identifier Information discussed above on the first page of the schedule. For each activity on the chart, indicate the Activity ID, Activity Description, Original Duration, Remaining Duration, Changes to Duration, Total Float, Early Start Date, Early Finish Date, and Calendar Name. Use arrows to show the relationships among activities.
- (3) Identify the critical path of the project on the bar chart. The critical path is defined as; 1) the sequence of activities that must be completed “on time” to ensure that the project finished on time. 2) the longest path of activities in the project that determines the project finish date.
- (4) No more than 10% of activities may be critical or near critical. Critical Activities will have a total float equal to zero. “Near critical” is defined as float in the range of 1 to 10 working days.
- (5) Six Week Look Ahead CPM Schedule in a Bar Chart Format – This schedule will have all the same requirements of the CPM schedule in bar chart format except that it shall be limited to those activities that have an early start or early finish within a six-week period of the data date.
- (6) Logic Diagram – Submit a diagram in PERT chart format showing the logic of the CPM schedule.
- (7) Activity ID Sort – Submit a listing of all activities included in the CPM schedule sorted by ascending Activity Identification Number.
- (8) Total Float Sort – Submit a listing of all activities included in the CPM schedule sorted by increasing total float and by early start date.
- (9) All float belongs to the Project and is a shared commodity between the Contractor and the Mobility Authority and is not for the exclusive use or benefit of either party. The Contractor shall notify the Engineer in writing for acceptance before using any float.
- (10) Detailed Predecessor/Successor Sort – Submit a listing of all activities included in the CPM schedule indicating the activities that immediately precede and immediately succeed that activity in the schedule logic.
- (11) Scheduling Statistics Report – Submit a report of CPM schedule statistics, including number of activities, number of activities on the longest path, number of started activities, number of completed activities, number of relationships, percent complete, and number and type of constraints.

- (12) A resource curves / Metric tracking reports (EVM) corresponding to the milestones and work activities established above.

Section 8.5.5.2.2 “Baseline Schedule” The second paragraph is voided and replaced by the following:

The Contractor shall submit a progress schedule for the entire duration of the Contract to the Engineer 30 calendar days following the contract award date. After review of the schedule the Engineer shall schedule a Baseline CPM Schedule meeting with the Contractor to review the schedule and identify any changes or corrections. Within 7 calendar days of the CPM Schedule meeting, the Contractor shall make any necessary adjustments to address all review comments and resubmit network diagrams and reports for the Engineer’s review. The complete baseline schedule shall be submitted and accepted no later than (45) forty-five days after contract award date. The complete progress schedule shall be accepted by the Engineer before any payments will be processed for the project.

Section 8.5.5.2.3 “Progress Schedule” is supplemented by the following

The Engineer may withhold pay estimates if the updated CPM schedule is not submitted as required by this section. For each updated CPM schedule, identify the actual start and finish dates for all completed activities, the actual start date and remaining duration for all activities in progress, the difference in duration of all activities since the last update and any exceptional reports associated with the update. Only accepted changes will be incorporated into the monthly progress schedule update. The schedule should represent the actual work performed and should be progressed with actuals for all the schedule activities. The final schedule will be utilized as the project actual “As Built” schedule.

Provide a written narrative that identifies any changes or shifts in the critical path and submit reasons for the changes or shifts in the critical path. Identify any changes in logic for the updated CPM schedule and submit reasons for changes to the schedule logic. In addition to the written narrative, submit the following with each updated CPM schedule:

- (1) CPM Schedule in Bar Chart Format
- (2) Four Week Look Ahead CPM Schedule in Bar Chart Format
- (3) Logic Diagram
- (4) Activity ID Sort
- (5) Total Float Sort
- (6) Detailed Predecessor/Successor Sort
- (7) Schedule Metrics and Earned Value (Schedule, Cost, Labor) Reports

The Contractor must submit a statement that there were no changes in the schedule logic, activity durations, or calendars since the previous update in lieu of submission of items (3), (5), and (6). Acceptance of schedule updates by the Engineer does not revise the Contract Documents.

A monthly schedule update meeting shall be held each month following Notice to Proceed to review monthly schedule update submittals, critical path items and recovery schedules. The Contractor shall be represented in the meeting by the Contractor’s scheduler, project manager and general superintendent. As necessary the Contractor may be also asked to attend a coordination meeting to discuss the schedule impacts to other contractors.

If the Project completion date changes or if the project schedule overrun is anticipated to exceed 5%, the Contractor shall submit a revised progress schedule to the Engineer for review and acceptance. If plan revisions are anticipated to change the sequence of construction in such a manner as will affect the progress, but not the completion date, then the Contractor may submit a revised progress schedule for review and acceptance. The Project completion date shall remain unchanged.

Section 8.5.5.3 “Notice of Potential Time Impact” is supplemented by the following

“Contractor shall not be eligible for Change Order(s) for additional compensation for additional costs, including costs for developing and executing a Recovery Schedule(s), and delay and disruption damages, or additional Days incurred directly or indirectly from the virus known as severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and the disease known as COVID-19, including any disruptions to, and delays or interruptions in, construction of the Project in accordance with the Contract and any approved Baseline Schedule.”

Section 8.5.5 "Schedule Types" is supplemented by the following:

Section 8.5.5.5 Recovery Schedule

If the progress schedule projects a finish date for the Project beyond the original Completion Date, the Contractor shall submit a revised schedule showing a plan to finish by the original Completion Date. The Mobility Authority will withhold Pay Estimates until the Engineer accepts the revised schedule. No additional compensation for developing and executing a recovery schedule(s) shall be reimbursed to the Contractor. The Engineer will use the schedule to evaluate time extensions and associated costs requested by the Contractor.

- (1) In the event Work or related construction activities shown on the Contractor's Progress Schedule fall behind schedule to the extent that dates established as contractual Completion Dates are in jeopardy, the Contractor shall prepare and submit to the Engineer, at no additional cost or time to the Mobility Authority, a Recovery Schedule showing intent to remedy delays and to regain originally scheduled time of completion of Work within a timely manner. This includes delays due to unforeseen conditions.
- (2) Recovery Schedule shall be submitted in such form and detail appropriate to the delay or delays, explaining and displaying how the Contractor intends to reschedule those activities and reestablish compliance with the accepted baseline Construction Progress Schedule during the immediate subsequent pay period or as permitted by Engineer. This shall include a schedule diagram comparing the original and the revised sequence of activities, identifying all affected activities.
- (3) Upon determining the requirement for a Recovery Schedule:
 - a. Within five (5) calendar days, the Contractor shall present to Engineer a proposed Recovery Schedule. The Recovery Schedule shall represent the Contractor's best judgment as to how to best reorganize the Work and achieve progress to comply with the accepted Construction Progress Schedule.
 - b. Changes to Contractor's means and methods, such as increased labor force, working hours, overtime, additional equipment and other means shall not constitute the basis for changes to the Contract Sum or Contract Time.
 - c. Recovery Schedule shall show remedies to bring Work back on schedule up-to-date within the immediate subsequent pay period.
 - d. The Recovery Schedule shall be prepared to a similar level of detail as the Construction Progress Schedule.
 - e. Five (5) calendar days prior to the expiration of the Recovery Schedule, Contractor shall document to the Engineer that the Work schedule has regained, or is on-track to regain, compliance with the Construction Progress Schedule.
- (4) Failure to submit Recovery Schedule in a timely manner may result in Termination of the Contract for Cause as determined by the Engineer.
- (5) Failure to achieve compliance with the accepted Construction Progress Schedule despite implementing Recovery Schedule may result in Termination of the Contract for Cause as determined by the Engineer.
- (6) Termination of Contract For Cause: In the event Contractor defaults on the terms of the Contract, including failure to maintain the Construction Progress Schedule, Engineer will assess the level of completion of the Work achieved by the Contractor and compare amount of available funds against anticipated costs required for the Mobility Authority to complete the Work, including anticipated Liquidated Damages resulting from delay, if any. Engineer will determine amount of payment due to Contractor for Work completed prior to date of Termination of Contract for Cause, if any. In the event available funds are not sufficient for the Mobility Authority to complete the Work, the Mobility Authority will withhold such funds from the amount due the Contractor.
- (7) If, in the opinion of the Engineer, the Contractor has sufficiently regained compliance with the Construction Progress Schedule, the use of the Construction Progress Schedule will be resumed. Contractor shall update and submit the Construction Progress Schedule clearly identifying Work to date and how the Contractor intends to achieve timely completion for the remainder of the Work in accordance with the Construction Documents.

Special Provision to Item 8 Prosecution and Progress



Item 8, "Prosecution and Progress" of the Standard Specification is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

Article 8.2., "Subcontracting," is supplemented by the following paragraph, which is added as paragraph six to this article:

The Contractor certifies by signing the Contract that the Contractor will not enter into any subcontract with a subcontractor that is not registered in the Department of Homeland Security's (DHS) E-Verify system. Require that all subcontractors working on the project register and require that all subcontractors remain active in the DHS E-Verify system until their work is complete on the project.

Special Provision to Item 8 Prosecution and Progress



Item 8, "Prosecution and Progress" of the Standard Specifications is amended with respect to the clause cited below. No other clauses or requirements of this Item are waived or changed.

Article 8.7.2., "Wrongful Default," is revised and replaced by the following:

If it is determined after the Contractor is declared in default, that the Contractor was not in default, the rights and obligations of all parties will be the same as if termination had been issued for the convenience of the public as provided in Article 8.8 "Termination of Contract."

Special Provision to Item 9

Measurement and Payment

Item 9, "Measurement and Payment," of the Standard Specifications, is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

Article 9.5., "Progress Payments," Delete this section of the Specifications in its entirety and substitute with the following:

Partial payments will be made once each month covering work performed and materials complete-in-place in accordance with the Contract. The invoice form to be submitted each month will be provided to the Contractor in Microsoft Excel format. The Contractor must be able to use Microsoft Excel to complete the invoice form. Partial payments will be made on the value of work performed based on approximate estimates prepared by the Engineer, provided, however, that no estimate shall be certified or payment made where the net amount receivable by the Contractor is less than Five-hundred Dollars (\$500.00).

The Engineer will review the partial payment estimate with the Contractor's representative prior to each partial payment.

Total Contract value shall be considered to mean the original amount of the Contract, except when the Contract is increased or decreased by a supplemental agreement in which case the adjusted total shall be used.

The Mobility Authority reserves the right to withhold the payment of any partial or final estimate voucher or any sum or sums thereof from such vouchers in the event of the failure of the Contractor to promptly make payment to all persons supplying equipment, tools or materials, or for any labor used by the Contractor in the prosecution of the work provided for in the Contract, and for any other cause as determined by the Mobility Authority in its sole discretion, including overpayment on previous partial payments.

Article 9.8., "Retainage," is supplemented with the following:

The Mobility Authority shall not withhold funds from payments to be made to Contractor for the Work until such time as 95% of the Adjusted Contract Price has been paid to the Contractor. Following completion of and payment for 95% of the Adjusted Contract Price, the Mobility Authority shall withhold, the remaining 5% of the Adjusted Contract Price pursuant to the terms described below.

The remaining 5% for the Work, subject to reduction as specified below, shall be held by the Mobility Authority until Final Acceptance. At such time, and provided the Contractor is not in breach or default hereunder, the Mobility Authority shall release to Contractor all withheld in connection with the Work other than amounts applied to the payment of Losses or which the Mobility Authority deems advisable, in its sole discretion, to retain to cover any existing or threatened claims. The Contractor must further warrant, to the satisfaction of the Mobility Authority, that there are no outstanding claims or liens by any subcontractors or other parties with respect to the Work.

The prime contractor shall make full payment of amounts due to subcontractors within 10 calendar days following the satisfactory completion of the subcontractor's work. Satisfactory completion of the subcontractor's work shall be defined as approval, acceptance, and payment for the subcontractor's work by the Mobility Authority including the submittal and acceptance of all information, deliverables or other documents required by the contract.

Prior to the release of the remaining 5% by the Mobility Authority pursuant to the terms hereof, such amounts shall be held by the Mobility Authority. Upon the release of the remaining 5%, the Contractor shall not be entitled to any interest income that has accrued upon the amounts of the remaining 5% released to Contractor.

Article 9.9., "Payment Provisions for Subcontractors," is supplemented with the following:

The Mobility Authority may pursue actions against the Contractor, including withholding of estimates and suspending the work, for noncompliance with the subcontract requirements of this Section upon receipt of written notice with sufficient details showing the subcontractor has complied with contractual obligations as described in this Article.

These requirements apply to all tiers of subcontractors. Incorporate the provisions of this Article into all subcontract or material purchase agreements.

Special Provision to Item 9

Measurement and Payment



Item 9, "Measurement and Payment" of the Standard Specifications is amended with respect to the clauses cited below. No other clauses or requirements of this Item are waived or changed.

Section 9.7.1.4.3., "Standby Equipment Costs," is voided and replaced by the following:

7.1.4.3. **Standby Equipment Costs.** Payment for standby equipment will be made in accordance with Section 9.7.1.4., "Equipment," except that the 15% markup will not be allowed and that:

Section 7.1.4.3.1., "Contractor-Owned Equipment," is voided and replaced by the following:

7.1.4.3.1. **Contractor-Owned Equipment.** For Contractor-owned equipment:

- Standby will be paid at 50% of the monthly Equipment Watch rate after the regional and age adjustment factors have been applied. Operating costs will not be allowed. Calculate the standby rate as follows.

$$\text{Standby rate} = (\text{FHWA hourly rate} - \text{operating costs}) \times 50\%$$

- If an hourly rate is needed, divide the monthly *Equipment Watch* rate by 176.
- No more than 8 hr. of standby will be paid during a 24-hr. day period, nor more than 40 hr. per week.
- Standby costs will not be allowed during periods when the equipment would have otherwise been idle.

Special Provision to Item 502

Barricades, Signs and Traffic Handling



Item 502, "Barricades, Signs and Traffic Handling" of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 502.1., "Description," is supplemented by the following:

Temporary work-zone (TWZ) traffic control devices manufactured after December 31, 2019, must have been successfully tested to the crashworthiness requirements of the 2016 edition of the Manual for Assessing Safety Hardware (MASH). Such devices manufactured on or before this date and successfully tested to NCHRP Report 350 or the 2009 edition of MASH may continue to be used throughout their normal service lives. An exception to the manufacture date applies when, based on the project's date of letting, a category of MASH-2016 compliant TWZ traffic control devices are not approved, or are not self-certified after the December 31, 2019, date. In such case, devices that meet NCHRP-350 or MASH-2009 may be used regardless of the manufacture date.

Such TWZ traffic control devices include: portable sign supports, barricades, portable traffic barriers designated exclusively for use in temporary work zones, crash cushions designated exclusively for use in temporary work zones, longitudinal channelizers, truck and trailer mounted attenuators. Category I Devices (i.e., lightweight devices) such as cones, tubular markers and drums without lights or signs attached however, may be self-certified by the vendor or provider, with documentation provided to Department or as are shown on Department's Compliant Work Zone Traffic Control Device List.

Article 502.4., "Payment," is supplemented by the following:

Truck mounted attenuators and trailer attenuators will be paid for under Special Specification, "Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)." Portable Changeable Message Signs will be paid for under Special Specification, "Portable Changeable Message Sign." Portable Traffic Signals will be paid for under Special Specification, "Portable Traffic Signals."

Special Provision to Item 506

Temporary Erosion, Sedimentation, and Environmental Controls



For this project, Item 506, "Temporary Erosion, Sedimentation, and Environmental Controls," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 506.1., "Description," is voided and replaced by the following:

Install, maintain, and remove erosion, sedimentation, and environmental control measures to prevent or reduce the discharge of pollutants in accordance with the Storm Water Pollution Prevention Plan (SWP3) or as directed. Ensure the installation and maintenance of control measures is performed in accordance with the manufacturer's or designer's specifications. Erosion and sediment control devices must be selected from the "Erosion Control Approved Products" or "Sediment Control Approved Products" lists. Perform work in a manner to prevent degradation of receiving waters, facilitate project construction, and comply with applicable federal, state, and local regulations.

Article 506.3., "Qualifications, Training, and Employee Requirements," is voided and not replaced.

Section 506.4.1., "Contractor Responsibilities," Section 506.4.2., "Implementation," and Section 506.4.3., "General," are voided and replaced by the following:

4.1. **Contractor Responsibilities.** Implement the SWP3 for the project site in accordance with the plans and specifications, and as directed. Coordinate storm water management with all other work on the project. Develop and implement an SWP3 for project-specific material supply plants within and outside of the Department's right of way in accordance with the specific or general storm water permit requirements. Prevent water pollution from storm water associated with construction activity from entering any surface water or private property on or adjacent to the project site.

4.2. **Implementation.**

4.2.1. **Commencement.** Implement the SWP3 as shown and as directed. Contractor proposed recommendations for changes will be allowed as approved. Do not implement changes until approval has been received and changes have been incorporated into the plans by the Engineer. Minor adjustments to meet field conditions are allowed and will be recorded by the Engineer in the SWP3.

Implement control measures before the commencement of activities that result in soil disturbance. Phase and minimize the soil disturbance to the areas shown on the plans. Coordinate temporary control measures with permanent control measures and all other work activities on the project to assure economical, effective, safe, continuous water pollution prevention. Provide control measures that are appropriate to the construction means, methods, and sequencing allowed by the Contract.

Do not prolong final grading and shaping. Preserve vegetation where possible throughout the project and minimize clearing, grubbing, and excavation within stream banks, bed, and approach sections.

4.3. **General.**

4.3.1. **Temporary Alterations or Control Measure Removal.** Altering or removal of control measures is allowed when control measures are restored within the same working day.

- 4.3.2. **Stabilization.** Initiate stabilization for disturbed areas no more than 14 days after the construction activities in that portion of the site has temporarily or permanently ceased. Establish a uniform vegetative cover or use another stabilization practice as approved.
- 4.3.3. **Finished Work.** Upon the Engineer's acceptance of vegetative cover or other stabilization practice, remove and dispose of all temporary control measures unless otherwise directed. Complete soil disturbing activities and establish a uniform perennial vegetative cover. A project will not be considered for acceptance until a vegetative cover of 70% density of existing adjacent undisturbed areas is obtained or equivalent permanent stabilization is obtained as approved.
- 4.3.4. **Restricted Activities and Required Precautions.** Do not discharge onto the ground or surface waters any pollutants such as chemicals, raw sewage, fuels, lubricants, coolants, hydraulic fluids, bitumens, or any other petroleum product. Operate and maintain equipment on site in a manner as to prevent actual or potential water pollution. Manage, control, and dispose of litter on site such that no adverse impacts to water quality occur. Prevent dust from creating a potential or actual unsafe condition, public nuisance, or condition endangering the value, utility, or appearance of any property. Wash out concrete trucks only in approved contained areas. Use appropriate controls to minimize the offsite transport of suspended sediments and other pollutants if it is necessary to pump or channel standing water (i.e. dewatering). Prevent discharges that would contribute to a violation of Edwards Aquifer Rules, water quality standards, the impairment of a listed water body, or other state or federal law.

Section 506.4.4., "Installation, Maintenance, and Removal Work." The first paragraph is voided and replaced by the following.

Perform work in accordance with the SWP3, and according to the manufacturers' guidelines. Install and maintain the integrity of temporary erosion and sedimentation control devices to accumulate silt and debris until soil disturbing activities are completed and permanent erosion control features are in place or the disturbed area has been adequately stabilized as determined by the Engineer.

Section 506.4.5., "Monitoring and Documentation," is voided and not replaced.

Section 506.6.5.2., "Maintenance Earthwork for Erosion and Sediment Control for Cleaning and/or Restoring Control Measures," is voided and replaced by the following:

Earthwork needed to remove and obliterate of erosion-control features will not be paid for directly but is subsidiary to pertinent Items unless otherwise shown on the plans.

Sprinkling and rolling required by this Item will not be paid for directly but will be subsidiary to this Item.

Special Provision to Special Specification 6185

Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)



Item 6185, "Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)" of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 4. "Measurement", is voided and replaced by the following:

- 4.1. **Truck Mounted Attenuator/Trailer Attenuator (Stationary).** This Item will be measured by the day. TMA/TAs must be set up in a work area and operational before a calendar day can be considered measurable. A day will be measured for each TMA/TA set up and operational on the worksite.
- 4.2. **Truck Mounted Attenuator/Trailer Attenuator (Mobile Operation).** This Item will be measured by the hour or by the day. The time begins once the TMA/TA is ready for operation at the predetermined site and stops when notified by the Engineer. When measurement by the hour is specified, a minimum of 4 hr. will be paid each day for each operating TMA/TA used in a mobile operation. When measurement by the day is specified, a day will be measured for each TMA/TA set up and operational on the worksite.

Special Specification 4079

Prestressed Ground Anchors



1. DESCRIPTION

Install post-tensioned permanent ground anchors in place, with grouting as required in accordance with the plans and these specifications. Ensure the ground anchors provide the load carrying capacities that will develop the load as required in the plans and the approved working drawings and in accordance with the testing requirements of this specification.

The Contractor has the option of furnishing any type of post-tensioning system and choose anchor diameter to develop the required load and meeting the requirements of these specifications. The Contractor may also propose to use proprietary systems, which do not conform to all provisions of this specification, if the concept is approved by the Engineer. The system selected must provide the magnitude and distribution of design prestressing force and minimum ultimate strength required by the plans without exceeding allowable temporary stresses. If Contractor cannot provide the load carrying capacities in accordance with the plans, additional anchors shall be installed. The Contractor has the option to change the anchoring procedure with the approval of the Engineer as long as the required load carrying capacity is achieved. Ensure design procedures, coefficients, and allowable stresses are in accordance with the latest Standard AASHTO Specifications for Highway Bridges.

2. MATERIALS

Provide materials required for use under this Item conforming to Table 1:

Table 1
Materials

Material	Conform to Item
Structural Steel	Item 441 and 442
Prestressing Steel	Item 426
Hydraulic Cement Concrete	Item 421

Provide prestressing steel conforming to one of the following types:

- Seven wire strand conforming to ASTM Designation A416: or.
- High-tensile strength alloy bars conforming to the requirements of ASTM designation A722.

Bars with greater minimum ultimate strength, but otherwise produced and tested in accordance with ASTM Designation A722, may be used provided they have no properties which make them less satisfactory than the specified material.

Wire or strand with greater ultimate strength but otherwise produced and tested in accordance with ASTM designation A416 and A421, and the requirements of this specification, are permitted provided the physical properties as outlined in the applicable specification are shown on the shop drawings and provided they have no properties which make them less satisfactory than the specified material.

Each ground anchor tendon is either a single bar or group of strands having a common end anchorage used to apply a stressing force to the structural member. Provide coated (unbonded) tendons except the portion which is established as the anchorage length. Coat the tendons a minimum of the unbonded length shown in

the plans. Ensure the anchorage length is bare and completely free of grease or other contaminants. Provide the minimum acceptable anchorage lengths shown in the plans.

Provide end anchorages and tendon couplers that develop at least 100% of the required ultimate strength of the tendon with a minimum elongation of 2%.

Use material for coating unbonded tendons that is non-volatile, low friction mineral oil base grease, with a rust preventing additive having a relatively uniform viscosity in a temperature range of 20 F to 120 F. Provide a protective sheathing around the tendon throughout the coated length consisting of 0.04 in. minimum thickness polyethylene or polyvinyl chloride tubing capable of maintaining the tendon tightly bundled and containing the lubricant.

Provide grout for ground anchors that is a neat cement or sand cement mixture, with a 7-day compressive strength of 3500 psi. Determine grout strengths by testing 2-in. cubes in accordance with Test Method TEX-307-D or 3 in. diameter by 6 in. high cylinders in accordance with Test Method TEX-418-A. Determine the grout strength by testing the initial grout batch. Additional testing is necessary if the grout mixture is modified or if required by the Engineer. If allowed by the Engineer, test results from previous projects using an identical grout mix may be accepted.

Identify the tendons by heat number, or reel number in the case of seven-wire strand, and tag them for identification. Identify anchorage assemblies in a like manner. At the request of the Engineer, furnish specimens for test purposes in accordance with Test Method TEX-710-I. Provide mill test reports for tendons used in permanent anchors.

Test complete tendons for compliance with the requirements of this specification at no expense to the Department and certify the results in writing. In addition, furnish for testing, one specimen of each size of prestressing tendon with end fittings attached at each end for ultimate strength tests only.

Provide a specimen 5 ft. in clear length measured between the ends of the fittings. If the results of the test indicate the necessity of check tests, furnish additional specimens at no cost to the Department. For prestressing systems previously tested and approved on Department projects, complete tendon samples need not be furnished provided there is no change in the material, design, or details previously approved. For the shop drawings or prestressing details, identify the project on which approval was obtained, otherwise sampling will be necessary. For prefabricated ground anchor assemblies, notify the Engineer at least 10 days before installing the end fittings or heading the wires so that sampling and testing may be arranged.

3. **PACKAGING, STORING, AND HANDLING**

Protect the prestressing steel against physical damage and corrosion from the time of manufacture to grouting or encasing in concrete.

Rust on prestressing steel, which can be removed by light rubbing, is acceptable. Streaks or spots, which may remain after rust removal, are acceptable if no pitting is present. Tight mill scale is acceptable but remove loose mill scale.

Protect prefabricated ground anchor assemblies from moisture by taping, wrapping, or by other acceptable means.

4. **EQUIPMENT**

Furnish suitable equipment to drill the holes to the diameter, depth, and line as specified in this specification or on the approved working drawings.

Furnish suitable hydraulic jacks for stressing the tendons. Equip jacks with gauges graduated to read directly to one percent of the total load applied, and calibrated to measure accurately the stress induced in the steel.

Provide jacks with a stroke of adequate length so that the stressing, including temporary overstress, can be done in one movement. Equip them with proper ports or windows for adequate visual examination and measurement of tendon movement. Ensure they are also capable of slow release of stress to allow relaxation from overstress to the proper seating force.

Furnish a grout mixer and pump of sufficient capacity to properly place grout in the quantities required.

5. WORKING DRAWINGS

Submit working drawings (i.e. shop drawings) for the ground anchors a minimum of one month prior to the installation of the ground anchors. Provide the details containing the necessary information for construction including:

- 5.1. **Prestressing Details.** On the drawings show details of type, size, number of units per ground anchor, ground anchor diameter, inclination, forces applied per anchor, end anchorage systems, grouting and venting ports, grouting procedure, acceptable elongation, temporary overstress, and other information necessary to properly complete the work.

On these details show the method of support for the ground anchors to insure that the proper location in the center of the hole can be maintained.

- 5.2. **Anchor Layout.** Provide drawings showing the layout of the anchors and required load.

Electronically submit working drawings formatted to fit standard 11x17 sheets in accordance with TxDOT's "Guide to Electronic Shop Drawing Submittals".

6. CONSTRUCTION

- 6.1. **General.** Before stressing the anchors, furnish certified copies of load calibration curves on the jacks and gauge systems to be used in the work. Recalibrate the stressing systems when required by the Engineer.

- 6.2. **Drilling.** Drill the hole within +/- 3 degrees from the line specified on the approved working drawings.

- 6.3. **Grouting.** Clear the hole of debris before placing the tendon. Insert the tendon in the hole and use supports to ensure that the tendon is centered in the hole with a maximum 1 in. of sag between the supports. Provide a grouting pipe that allows placing the grout from the bottom of the hole. Before beginning to pump the grout, check the grout tubes to ensure they are clear. When the tendon is grouted through the center of a hollow auger, no grout tube or centralizers are required as long as grout pressure is maintained while withdrawing the auger.

Grout the anchors immediately after placing them in the hole. Pump the grout from the bottom of the hole toward the top, continuously under pressure, until the grout is within approximately one foot of the top of the hole. Grout the hole full length in one stage with clearance provided between the grout and the tendon anchorage.

If the grout level in the hole cannot be maintained, withdraw the tendon and redrill the hole after at least 24 hours have passed.

Record the data shown in Table 2 concerning the grouting:

Table 2
Grouting Data to Record

Water-cement ratio
Types of additives
Types of cement
Volume of grout
Type of Mixer

6.4. **Corrosion Protection.** The Contractor shall provide "Double Corrosion Protection", in which the post-tensioned strand or bar is encapsulated in a corrugated plastic sheath (>40 mil) and cement grout annulus. This detail will be submitted to the Engineer for review and approval.

6.5. **Post-Tensioning.** Do not begin post-tensioning until the concrete in the associated structural members has reached the design strength specified.

Provide suitable means for measuring the movement of the anchor head to the nearest 0.001 in.

Indicate on the prestressing details, a sequence of post-tensioning that prevents overstressing the structural member.

Ensure the prestressing details submitted reflect the following general tensioning procedure modified as required for each particular installation, unless otherwise required by the plans.

- Tendons in the sequence designated in the Prestressing Details.
- Perform initial tensioning to take the slack out of the tendons at 10% of the maximum tensioning load unless otherwise shown on the approved Prestressing Details.
- After the initial tensioning, set up an independent reference to measure the anchor movement.

Ensure the movement measured between the maximum proof load and the lock-off load is within the following limits:

- Determine the minimum movement limit based on the elastic elongation calculated using 80% of the unbonded length.
- Determine the maximum movement limit based on the elastic elongation calculated using the entire unbonded length plus 50% of the bonded length.

If the movement measured is not within the above specified limits, the anchor will be rejected. In that case, install a replacement anchor at no cost to the Department.

- Proof load every anchor to not less than 133 percent of its design loading. During the proof loading operation, the prestressing force shall not be more than 80 percent of the guaranteed ultimate strength of the prestressing steel. The duration of the proof loading shall be 2 minutes. Successively apply and record total movements for the following load increments to the test load: 0.25DL, 0.50DL, 0.75DL, 1.00DL, 1.20DL, 1.33DL (i.e., the test load). Hold the test load for 2 min. and record the movement. If the anchor movement exceeds 0.02 in. during the 2 min. hold, proceed as described in the performance test section with the test load held for a total of 60 min. The prestressing force must be transferred (locked-off) at a level of between 10 and 70 percent of its guaranteed ultimate tensile strength as required to provide the design loads shown on the plans.
- Performance testing of 5 percent or a minimum of 3 anchors, whichever is greater, shall be performed in accordance with the following procedures

The performance test shall be made by incrementally loading and unloading the anchor in accordance with the following schedule. All loads except the maximum test load need only be held long enough to obtain the movement reading.

Performance Test Schedule

AL	AL
0.25 DL	0.25 DL
AL	0.50 DL
0.25 DL	0.75 DL
0.50 DL	1.00 DL
AL	1.20 DL
0.25 DL	AL
0.50 DL	0.25 DL
0.75 DL	0.50 DL
AL	0.75 DL
0.25DL	1.00 DL
0.50 DL	1.20 DL
0.75 DL	1.33 DL Maximum Test Load
1.00 DL	AL

AL - Alignment Load; DL - Design Load

The maximum test load will be held for 10 min. Record the anchor movement with respect to a fixed reference at 1, 2, 3, 4, 5, and 10 min. If the movement between 1 min. and 10 min. exceeds 0.04 in., the test will be continued for an additional 50 min. If the test is extended, record the movement at 15, 20, 30, and 60 min. Measure time after reaching the 1.33 DL increment. If the movement exceeds 0.08 in. during the 50 min. hold (i.e. from 10 min. to 60 min.) the anchor will be rejected and considered a failure.

- If anchor fails at a certain pre-assigned location, the Contractor has the option to offset the anchor location at a distance of 3 times the sleeve diameter. The Contractor will submit shop drawings for additional locations for the approval by the Engineer.
- Prior to final grouting, perform lift off tests 48 hr. after the initial tensioning on the first permanent ground anchor and on the same anchors for which performance testing was carried out on. Ensure the lift off load within 10% of the lock off load.
- Perform final grouting of the anchor plate area as indicated on the plans within 3 days after tensioning and lift off tests for an anchor have been completed.

Ground anchors will be considered acceptable if the anchor movement in any testing does not exceed the 0.08 in per log cycle of time. The anchor movements must also fall within the limits stated in Article 6.E.3 above.

Anchors which fail to attain the maximum test load required as stated above may be incorporated into the anchorage system at a load capacity equal to one half their failure loads. The failure load is the load indicated by the pressure gauge 10 min. after failure occurs. Install additional anchors to replace or supplement the failed anchor. The Contractor is responsible for the entire cost of installing any required additional anchors, or changes in the original anchor design.

7. MEASUREMENT

This Item will be measured by linear foot of fully acceptable anchors complete in place.

8. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Prestressed Ground Anchors." This price is full compensation for work performed, materials furnished, labor, tools, equipment, and incidentals. Prestressed ground anchor tests are subsidiary to this item.

Special Specification 6001

Portable Changeable Message Sign



1. DESCRIPTION

Furnish, operate, and maintain portable trailer mounted changeable message sign (PCMS) units.

2. MATERIALS

Furnish new or used material in accordance with the requirements of this Item and the details shown on the plans. Provide a self-contained PCMS unit with the following:

- Sign controller
- Changeable Message Sign
- Trailer
- Power source

Paint the exterior surfaces of the power supply housing, supports, trailer, and sign with Federal Orange No. 22246 or Federal Yellow No. 13538 of Federal Standard 595C, except paint the sign face assembly flat black.

2.1. **Sign Controller.** Provide a controller with permanent storage of a minimum of 75 pre-programmed messages. Provide an external input device for random programming and storage of a minimum of 75 additional messages. Provide a controller capable of displaying up to 3 messages sequentially. Provide a controller with adjustable display rates. Enclose sign controller equipment in a lockable enclosure.

2.2. **Changeable Message Sign.** Provide a sign capable of being elevated to at least 7 ft. above the roadway surface from the bottom of the sign. Provide a sign capable of being rotated 360° and secured against movement in any position.

Provide a sign with 3 separate lines of text and 8 characters per line minimum. Provide a minimum 18 in. character height. Provide a 5 × 7 character pixel matrix. Provide a message legibility distance of 600 ft. for nighttime conditions and 800 ft. for normal daylight conditions. Provide for manual and automatic dimming light sources.

The following are descriptions for 3 screen types of PCMS:

- **Character Modular Matrix.** This screen type comprises of character blocks.
- **Continuous Line Matrix.** This screen type uses proportionally spaced fonts for each line of text.
- **Full Matrix.** This screen type uses proportionally spaced fonts, varies the height of characters, and displays simple graphics on the entire sign.

2.3. **Trailer.** Provide a 2 wheel trailer with square top fenders, 4 leveling jacks, and trailer lights. Do not exceed an overall trailer width of 96 in. Shock mount the electronics and sign assembly.

2.4. **Power Source.** Provide a diesel generator, solar powered power source, or both. Provide a backup power source as necessary.

2.5. **Cellular Telephone.** When shown on the plans, provide a cellular telephone connection to communicate with the PCMS unit remotely.

3. CONSTRUCTION

Place or relocate PCMS units as shown on the plans or as directed. The plans will show the number of PCMS units needed, for how many days, and for which construction phases.

Maintain the PCMS units in good working condition. Repair damaged or malfunctioning PCMS units as soon as possible. PCMS units will remain the property of the Contractor.

4. MEASUREMENT

This Item will be measured by each PCMS or by the day used. All PCMS units must be set up on a work area and operational before a calendar day can be considered measurable. When measurement by the day is specified, a day will be measured for each PCMS set up and operational on the worksite.

5. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Portable Changeable Message Sign." This price is full compensation for PCMS units; set up; relocating; removing; replacement parts; batteries (when required); fuel, oil, and oil filters (when required); cellular telephone charges (when required); software; and equipment, materials, tools, labor, and incidentals.

Special Specification 6064

Intelligent Transportation System (ITS) Pole with Cabinet



1. DESCRIPTION

Furnish, install, relocate, or remove Intelligent Transportation System (ITS) pole structures and pole mounted cabinets of the various types and sizes at locations shown on the plans, or as directed.

1.1. **ITS Equipment Application.** At a minimum, the ITS pole structure serves as the structural support for the following ITS equipment applications:

- closed circuit television (CCTV),
- fixed video,
- microwave vehicle detector (MVD) or radar vehicle sensing device (RVSD),
- bluetooth equipment,
- wireless radio equipment,
- environmental sensor station (ESS),
- solar power system, and
- pole mounted cabinets.

Ensure the equipment, design, and construction use the latest available techniques with a minimum number of different parts, subassemblies, circuits, cards, and modules to maximize standardization and commonality.

Design the equipment for ease of maintenance. All component parts must be readily accessible for inspection and maintenance. The only tools and test instruments required for maintenance by maintenance personnel must be simple hand held tools, basic meters and oscilloscopes.

2. MATERIALS

Provide materials that comply with the details shown on the plans or as directed, the requirements of this Item, and the pertinent requirements of the following Items:

- Item 416, "Drilled Shaft Foundations,"
- Item 421, "Hydraulic Cement Concrete,"
- Item 440, "Reinforcement for Concrete,"
- Item 441, "Steel Structures,"
- Item 442, "Metal for Structures,"
- Item 445, "Galvanizing,"
- Item 449, "Anchor Bolts,"
- Item 496, "Removing Structures,"
- Item 618, "Conduit,"
- Item 620, "Electrical Conductors," and
- Item 740, "Graffiti Removal and Anti-Graffiti Coating".

2.1. **Anchor Bolts.** Provide anchor bolts, nuts, and washers that conform with the details shown on the plans, the requirements of this Item, and in accordance with Item 449, "Anchor Bolts."

Furnish "medium strength, mild steel" anchor bolts for anchor bolts 1 in. or less in diameter, unless otherwise shown on the plans. Furnish "alloy steel" anchor bolts for anchor bolts greater than 1 in. diameter, unless otherwise shown on the plans.

- 2.2. **ITS Poles.** Provide material for pole shafts that conforms to the requirements on the plans and the requirements of ASTM A1011 SS Grade 50, A572 Grade 50, A1011 HSLAS Grade 50, or A595 Grade A. Material thicknesses in excess of those stipulated under A1011 will be acceptable providing it meets all other ASTM A1011 requirements and the requirements of this specification. A595 Grade A material must have a minimum of 50 ksi yield strength adjacent to base welds after fabrication.

Fabrication plants that produce steel ITS poles must be approved in accordance with DMS-7380, "Steel Non-Bridge Member Fabrication Plant Qualification." The Department maintains an MPL of approved ITS pole fabrication plants.

- 2.3. **ITS Pole Mounted Cabinet.** Provide ITS pole mounted cabinets to house ITS field equipment as shown on the plans or as directed. ITS equipment applications inside the cabinet may include, but is not limited to:

- CCTV field equipment,
- fixed video,
- radar vehicle sensing device (RVSD),
- dynamic message sign (DMS) or lane control signal (LCS) controller,
- bluetooth equipment,
- highway advisory radio (HAR),
- media conversion equipment,
- hardened ethernet switch,
- wireless radio equipment,
- environmental sensor station (ESS),
- roadway weather information system (RWIS), and
- solar power system.

Provide the cabinet with fully wired back panels, with all the necessary terminal boards, wiring, harnesses, connectors and attachment hardware for each cabinet location. Place all terminals and panel facilities on the lower portion of the cabinet walls below all shelves.

Typically, an ITS pole mounted cabinet may contain, but is not limited to, the following:

- 19-in. EIA rack,
- adjustable shelves,
- fan and thermostat,
- cabinet light,
- back panel,
- surge protection,
- terminal strips,
- interconnect harnesses with connectors,
- "Door Open" connection to back panel,
- ITS equipment hardware (as listed in Article 2.3), and
- all necessary installation and mounting hardware.

Ensure all cabinets are identical in size, shape and quality for each type as provisioned on the plans or as directed. Equip and configure the cabinet set-up as defined in this Specification and as detailed in the ITS pole with cabinet standards.

Submit details of the cabinet design and equipment layout for each cabinet to the Engineer for review and approval before fabrication.

2.4. Electrical Requirements.

- 2.4.1. **Primary Input Power Interruption.** Use material that meets all the requirements in Section 2.1.4., "Power Interruption" of the National Electrical Manufacturers Association (NEMA) Standard TS2 for traffic control system, or most current version.
- 2.4.2. **Power Service Transients.** Use material that meets all the requirements in Section 2.1.6., "Transients" of the NEMA Standard TS2 for traffic control system, or most current version.
- 2.4.3. **Power Service Protection.** Ensure that equipment contains readily accessible, manually resettable or replaceable circuit protection devices (such as circuit breakers or fuses) for equipment and power source protection. Provide circuit breakers or fuses sized such that no wire, component, connector, PC board or assembly is subjected to sustained current in excess of their respective design limits upon failure of any single circuit element or wiring.
- 2.4.4. **Power Distribution Panel.** Provide cabinets with a 120 VAC +/- 5 VAC power distribution panel. Provide the following components on the panel:
- 2.4.4.1. **Duplex Receptacles.** Provide two 120 VAC NEMA Type 5-15R duplex receptacles, or as shown on the plans, protected by a circuit breaker. Permanently label duplex receptacles "For Internal ITS Equipment Only." Install duplex receptacles in an isolated location and provide a clear 1/8 in. thick removable cover made from transparent thermoplastic material to cover the duplex receptacles. Ensure this cover is installed as not to interfere with the functional operation within the cabinet and allows enough space to plug in AC adapters and any necessary equipment. Submit alternative cover material for approval as part of the documentation submittal requirement.
- 2.4.4.2. **Ground Fault Circuit Interrupter (GFCI) Duplex Receptacles.** Provide at least one 120 VAC NEMA Type 5-15R GFCI duplex receptacle, or as shown on the plans, protected by a circuit breaker. This GFCI duplex receptacle is intended for maintenance personnel and is not to be used to serve equipment inside the cabinet. Permanently label GFCI duplex receptacles "For Personnel Use." Install GFCI duplex receptacles in a readily accessible location.
- Provide a 120 VAC, rack mountable outlet strip with 6 NEMA Type 5-15R receptacles with surge suppression. Plug outlet strip into GFCI duplex receptacle and label for personnel use.
- Circuit Breakers.** Determine the ampere rating, quantity, and configuration for main, accessory, spare, and equipment circuit breakers to support ITS equipment loads as shown on the plans. Provide Underwriters Laboratories (UL) 489 listed circuit breakers capable of operating in accordance with Section 2, "Environmental Standards and Test Procedures" of NEMA TS2-2003, or most current version. Provide circuit breakers with an interrupt capacity of 5,000 A. and insulation resistance of 100 megohms at 500 VDC. Provide minimum ampere rating for the following circuit types:
- 2.4.4.2.1. **Main Breaker.** Size the main circuit breaker such that the load of all branch circuits is less than the main circuit breaker ampere rating in accordance with the most current version of the National Electrical Code (NEC).
- 2.4.4.2.2. **Accessory Breaker.** Minimum 15 A. Size accessory circuit breaker to protect lighting, door switches, fans, and GFCI duplex receptacle in accordance with the most current version of the NEC.
- 2.4.4.2.3. **Equipment Breakers.** Minimum 15 A. Size equipment circuit breaker to protect ITS equipment and duplex receptacles in accordance with the most current version of the NEC.
- 2.4.4.2.4. **Spare Equipment Breaker.** Minimum 20 A. Provide one spare equipment breaker for future use.

Furnish breakers, which are in addition to any auxiliary fuses, with the electronic equipment to protect component parts. Provide 3-terminal lightning arrestor to protect the load side of all circuit breakers. Connect

the arrester into the circuit with size 8 AWG or larger stranded copper conductors. Connect arrester to the line filter as recommended by the manufacturer.

2.4.4.3. **Power Line Surge Protection.** Provide and install power line surge protection devices that meet the requirements of Article 2.6.

2.4.4.4. **Power Cable Input Junction Terminals.** Provide power distribution blocks suitable for use as a power feed and junction points for 2 and 3 wire circuits. Accommodate up to No. 4 AWG conductors on the line side of each circuit. Provide appropriate sized lugs at the junction terminals for conductors larger than a No. 4 AWG when shown on the plans.

Electrically isolate the AC neutral and equipment ground wiring from the line wiring by an insulation resistance of at least 10 megohms when measured at the AC neutral. Color code the AC neutral and equipment grounding wiring white and green respectively in accordance with the most current version of the NEC.

Utilize the back panel to distribute and properly interconnect all cabinet wiring related to the specific complement of equipment called out on the plans. Each item of equipment including any furnished by the Department must have the cable harness properly terminated at terminal boards on the back panel. Ensure all functions available at the equipment connector are carried in the connector cable harness to the terminal blocks from the power distribution panel mounted on the left side panel of the cabinet.

2.4.5. **Alternative Power Option.** When shown on the plans, accommodate renewable electrical power source for the design load specified in accordance with "ITS Solar Power System" Specification. Renewable electrical power source may, or may not, be integrated with public utility electrical services, as shown on the plans or as directed. Accommodate solar system components including batteries and solar charge controller when shown on the plans.

2.4.6. **Wiring.** Ensure all cabinet wiring identified by the use of insulated pre-printed sleeving slipped over the wire before attachment of the lug or making the connection. Supply enough text on wire markers in plain words or abbreviations with sufficient level of detail so that a translating sheet will not be required to identify the type and size of wire.

Cut all wires to the proper length before assembly. Ensure no wires are doubled back to take up slack. Ensure harnesses to connectors are covered with braided cable sleeves. Secure cables with nylon cable clamps.

Provide service loops to facilitate removal and replacement of assemblies, panels and modules. Use insulated parts and wire rated for at least 600 V. Color-code harnesses and wiring.

Route and bundle all wiring containing line voltage AC separately and shield from all low voltage, i.e., control circuits. Cover all conductors and live terminals or parts, which could be hazardous to maintenance personnel, with suitable insulating material.

Provide AC internal cabinet wiring identified in accordance with the most current version of the NEC. Provide white insulated conductors for AC neutral. Provide green insulated conductors for equipment ground. Provide any color different from the foregoing on other conductors in accordance with the most current version of the NEC. For equipment that requires grounding, provide grounding conductors and do not use conduit for grounding. Provide No. 22 AWG or larger stranded conductors for internal cabinet wiring. Provide conductors that are UL-listed THHN in accordance with the most current version of the NEC. Ensure the insulation has at least a thickness of 10 mm. Ensure all wiring containing line voltage is at least size No. 14 AWG. No strands of any conductor may be trimmed to "fit" the wiring into the breaker or terminal block.

2.4.7. **Terminal Strips.** Provide terminal strips located on the back panel that are accessible to the extent that it is not necessary to remove the electronic equipment from the cabinet to make an inspection or connection.

Ensure terminal blocks are 2 position, multiple pole barrier type.

Provide shorting bars in each of the positions provided along with an integral marking strip.

Arrange terminal blocks such that they will not upset the entrance, training and connection of incoming field conductors.

Identify all terminals with legends permanently affixed and attached to the terminal blocks.

Ensure not more than 3 conductors are brought to any 1 terminal screw.

Ensure no electrically energized components or connectors extend beyond the protection afforded by the barriers.

Locate all terminal blocks below the shelves.

Ensure terminals used for field connections are secure conductors by means of a No. 10-32 nickel or cadmium plated brass binder head screw.

Ensure terminals used for interwiring connections, but not for field connections, are secure conductors by means of a No. 5-32 nickel plated brass binder head screw.

Terminate all connections to and from the electronic equipment to an interwiring type block. These blocks will act as intermediate connection points for all electronic equipment input and output.

Provide termination panels that are used to distribute and properly interconnect all cabinet wiring related to the specific complement of equipment as shown on the plans. Provide properly terminated cable harnesses for each item including any furnished by the Department. Provide all functions available at the equipment terminals that are carried in the connector cable harness.

- 2.4.8. **Cabinet Internal Grounding.** The cabinet internal ground consists of at least 1 ground bus-bar permanently affixed to the cabinet and connected to the grounding electrode.

Use bare stranded No. 4 AWG copper wire between bus-bars and between the bus-bar and grounding electrode when providing multiple bus-bars.

Ensure each copper ground bus-bar has a minimum of 12 connection points, each capable of securing bare conductor ranging in size from No 4 AWG to No 14 AWG.

Return AC neutral and equipment ground wiring to these bus-bars.

- 2.4.9. **Door Switch.** Provide door switch meeting the following requirements:

- momentary, pin-type door switch,
- installed in the cabinet or on the door, and
- connected to a terminal so that the equipment installed in the cabinet can confirm input is connected to logic ground when the cabinet door is open.

Provide 2 momentary, pin type door switches for each door provided with the cabinet. Wire 1 switch to turn on the cabinet lights when the door is open and off when the door is closed. Wire the other in parallel to a terminal block to detect a cabinet intrusion condition.

- 2.5. **Mechanical Requirements.**

- 2.5.1. **Size and Construction.** Provide ITS pole mounted cabinets meeting the configuration types detailed in the Statewide ITS pole with cabinet standards.

Table 1
Minimum Cabinet Internal Dimensions

	Depth (in.)	Width (in.)	Height (in.)
Type 1	12 ¹	24	24
Type 2	18	24	36
Type 3	20	24	41

1. Minimum dimension for cabinet provided without EIA 19 in. rack assembly.
Provide 18 in. minimum depth when providing EIA 19 in. rack assembly.

Determine the suitability of the listed cabinet configuration types for the equipment at each field location identified on the plans or as desired.

- 2.5.2. **Ventilation.** Provide the cabinet with vent openings to allow cooling of electronic components.

Locate louvered air intake vent openings on the lower portion of the cabinet doors and covered fully on the inside with a commercially available disposable 3 layer graded pleated type filter of minimum size 6 in. (high) x 12 in. (wide) for Type 1 cabinet and 12 in. (high) x 16 in. (wide) for Type 2 and 3 cabinets. Size the louvered intake area and filter to allow maximum filtered air flow and cooling, securely mounted so that any air entering the cabinet must pass through the filter. Ensure the cabinet opening for intake of air is large enough to accommodate filter size. Screen the exhaust to prevent entry of insects. Provide the screen openings no larger than 0.0125-sq. in.

Provide a, minimum of 2, thermostatically controlled fans that are adjustable with an adjustment range of 70 to 110°F. Provide a press-to-test switch to test the operation of the fan. Provide a fan with a capacity of at least 110 cfm each.

There is no opening on the roof of the cabinet.

- 2.5.3. **Lighting.** Provide minimum 15 W fluorescent fixtures above each door inside the cabinet, each with clear shatter proof lens. NEMA TS2 rated light-emitting diode (LED) fixtures are acceptable instead of fluorescent light fixtures. Determine the appropriate number of fixtures to achieve at least 1000 lumens to illuminate the equipment. Position the fixtures to provide illumination to the face of the equipment in the cabinet and not into a technician's eyes.

- 2.5.4. **Exterior Finish.** Provide cabinets with a smooth aluminum finish and the exterior in its unpainted natural color.

When shown on the plans or as directed, provide cabinets with an anti-graffiti coating in accordance with Item 740 "Graffiti Removal and Anti-Graffiti Coating."

- 2.5.5. **Serial Number.** Provide the cabinets with a serial number unique to the manufacturer, preceded by an assigned 2 letter manufacturer's code. Provide at least a 0.2 in. letter height. Stamp the entire identification code and number on a metal plate which is riveted to the cabinet, stamp directly on the cabinet wall, or engrave on a metalized mylar plate that is epoxied on the upper right hand cabinet side wall.

- 2.5.6. **Modular Design.** Provide cabinets that have a modular design and allows ITS equipment to be installed in a variety of mounting configurations as detailed on the plans or as directed.

Provide Type 1 and Type 2 cabinets with 2 unistrut or DIN rail channels on each side wall of the cabinet for mounting power panel and auxiliary ITS equipment. Provide a 19 in. EIA rack assembly only when noted on the plans or in the general notes.

Provide Type 3 cabinets with an EIA 19 in. rack assembly, sized appropriately based on cabinet type inside height dimension and is accessible from either door. Provide a rack with a minimum of one 1RU (RU = rack

unit) horizontal power strip. Provide 2 unistrut or DIN rail channels on each side wall of the cabinet for mounting power panel and auxiliary ITS equipment.

- 2.5.7. **Shelves.** Provide adjustable shelves in each cabinet as required to support the equipment as specified on the plans. Ensure shelf adjustment at 1 RU intervals in the vertical position. Provide shelves that can be mounted to an EIA 19 in. rack cage or unistrut channel as detailed in the standards.

Provide shelves that are removable and capable of supporting the electronic equipment. Provide a minimum of 2 in. between the back and front edge of the shelf to back inside wall and door of the cabinet respectively to allow room for the equipment cables and connectors.

Provide each cabinet type with at least 1 slide out drawer with telescoping drawer guides to allow full extension from the rack frame. Provide at least 1.75 in. (high) x 16 in. (wide), drawer sized appropriately for the cabinet with a hinged lid to allow access to storage space.

- 2.5.8. **Mounting Hardware.** Provide cabinets with the appropriate "U" channel mounting brackets, stiffening plates, anchor bolts, and any other necessary hardware to mount the cabinet on the ITS pole structure. Provide mounting brackets made of 0.250 in. thick steel.

Weld cabinet mounting plates to the pole. This may be done in the field for transport reasons. Do not band the cabinet or mounting plates to the pole. Design the cabinet for pole mounting and reinforce at the points of attachment to the pole

- 2.6. **Surge Protective Devices (SPD).** Provide SPDs to protect electronics from lightning, transient voltage surges, and induced current. Install SPDs on all power, data, video, and any other conductive circuit.

- 2.6.1. **120 V or 120/240 V SPD at Service and ITS Cabinet Power Distribution Panel.** Install an SPD at the closest termination or disconnection point where the supply circuit enters the cabinet. Locate the SPD on the load side of the cabinet power distribution panel breakers and ahead of any and all electronic devices. Keep leads as short as possible with all conductor bends formed to the maximum possible radius. Connect the SPD ground lead directly to the ground bus. Use of wire nuts is prohibited. Install in accordance with manufacturers recommendations.

Provide UL Listed Type 1 or Type 2 SPD and labeled to UL 1449 Third Edition, posted at UL.com, under Certifications UL Category Code VZCA, and have a 20 kA I-nominal rating. Provide SPD rated as NEMA 4. SPD with integral EMI/RFI line filtering may be required if shown on the plans.

Do not exceed 700 V on the Voltage Protection Rating (VPR) on any mode (L-N, L-G, and N-G).

Do not exceed 150 V on the Maximum Continuous Operating Voltage (MCOV).

Equal or exceed 40 kA the SPD surge current rating per mode (L-N), (L-G), (N-G).

Equal or exceed 50 kA or the available short circuit current, whichever is higher for the SPD Short Circuit Current Rating (SCCR).

Provide SPD with directly connected Metal Oxide Varistors (MOV) exceeding 32 mm in diameter with thermal safety disconnectors. Gas tube and spark gap SPD are not be permitted. Ensure each MOV's operational status can be monitored via visual indicator, including N-G mode.

Provide SPD with one set of Normally Open (NO), Normally Closed (NC) Form C contacts for remote monitoring.

Ensure the SPD utilized for AC power does not dissipate any energy and does not provide any series impedance during standby operation. Return the unit to its non-shunting mode after the passage of any surge and do not allow the shunting of AC power

- 2.6.2. **Parallel SPD for 120 V Equipment.** Install an SPD inside of the cabinet on the power distribution to the equipment. Keep leads as short as possible with all conductor bends formed to the maximum possible radius. Connect the SPD ground lead directly to the ground bus. Use of wire nuts is prohibited. Install in accordance with manufacturers recommendations.

Provide UL Listed Type 1 or Type 2 SPD labeled to UL1449 Third Edition, posted at UL.com, under Certifications UL Category Code VZCA, and have a 20 kA I-nominal rating. Provide SPD rated as NEMA 4.

Do not exceed 700 V on the Voltage Protection Rating (VPR) on any mode (L-N and N-G).

Do not exceed 150 V on the Maximum Continuous Operating Voltage (MCOV).

Equal or exceed 40 kA the SPD surge current rating per mode (L-N) and (N-G).

Equal or exceed 50 kA or the available short circuit current, whichever is higher for the SPD Short Circuit Current Rating (SCCR).

Provide SPD with directly connected Metal Oxide Varistors (MOV) exceeding 32 mm in diameter with thermal safety disconnectors. Gas tube and spark gap SPD are not be permitted. Ensure each MOV's operational status can be monitored via visual indicator, including N-G mode.

Provide SPD with one set of Normally Open (NO), Normally Closed (NC) Form C contacts for remote monitoring.

- 2.6.3. **Low-Voltage Power, Control, Data and Signal Systems SPD.** Install a specialized SPD on all conductive circuits including, but not limited to, data communication cables, coaxial video cables, and low-voltage power cables. Ensure that these devices comply with the functional requirements shown in Table 2 for all available modes (i.e., power L-N, N-G; data and signal center pin-to-shield, L-L, L-G, and shield-G where appropriate).

These specialized SPD must have an operating voltage matching the characteristics of the circuit. Ensure that these specialized SPD are UL 497B or UL 497C Listed, as applicable.

Provide the SPD with 3 stages of surge suppression in a Pi (π) configuration. The first stage (primary side) consists of parallel-connected Gas Discharge Tubes (GDTs). The second stage consists of a series connected resistor or inductor. The third stage (secondary side) consists of parallel-connected transorbs or silicone avalanche diodes (SADs).

Ground the SPD to the DIN rail and a wire terminal connection point. (Grounding solely through the DIN rail connection is not adequate and does not meet the performance or intent of this specification.)

Install coaxial SPDs in a manner that prevents ground loops and resulting signal deterioration. This is usually caused where the cable has different references to ground at either end and connecting SPDs at both ends that have only Pin to Shield protection completes a ground loop circuit through the Shield. SPDs having Pin to Shield protection, and separate Shield to Ground protection are acceptable to eliminate ground loops.

Table 2
SPD Minimum Requirements

Circuit Description	Maximum Continuous Operating Voltage (MCOV)	Frequency/ Bandwidth/ Data Rate	Surge Capacity	Maximum Let-Through Voltage
12 VDC	15-20 V	N/A	5 kA per mode (8x20 μ s)	<150 Vpk
24 VAC	30-55 V	N/A	5kA per mode (8x20 μ s)	<175 Vpk
48 VDC	60-85 V	N/A	5 kA per mode (8x20 μ s)	<200 Vpk
Coaxial Composite Video	4-8 V	Up to 1.5 GHz	10 kA per mode (8x20 μ s)	<100 Vpk
RS422/RS485	8-15 V	Up to 10 Mbps	10 kA per mode (8x20 μ s)	<30 Vpk
T1	13-30 V	Up to 10 Mbps	10 kA per mode (8x20 μ s)	<30 Vpk
Ethernet Data	7-12 V	Up to 100 Mbps	3kA per mode (10x1000 μ s)	<30 Vpk

- 2.7. **Environmental Design Requirements.** Provide cabinets that meet the functional requirements of this Item during and after subsection to any combination of the following requirements:
- ambient temperature range of -30 to 165°F,
 - temperature shock not to exceed 30°F per hour, during which the relative humidity does not exceed 95%,
 - relative humidity range not to exceed 95% over the temperature range of 40 to 110°F, and
 - moisture condensation on all surfaces caused by temperature changes.
- 2.8. **Vibration.** Material used must show no degradation of mechanical structure, soldered components, plug in components or satisfactory operation in accordance with the manufacturer's equipment specifications after being subjected to the vibration test as described in the NEMA standard TS2, Section 2.2.8, "Vibration Test", or the latest revision.

3. FABRICATION

- 3.1. **Anchor Bolts.** Fabricate anchor bolts, nuts, and washers in accordance with the details shown on the plans and Item 449, "Anchor Bolts." Galvanize these items in accordance with Item 445, "Galvanization."
- Provide 2 circular steel templates as shown on the plans conforming to ASTM A36 for each assembly. Tack weld the lower anchorage nuts to the lower template in the shop. Perform this welding with an appropriate jig to ensure that the anchor bolt is perpendicular to the template. Shipping of the anchor bolt cage in its assembled condition is not required.

- 3.2. **ITS Poles.** Fabricate ITS poles in accordance with the details shown on the plans, this Item, and Item 441, "Steel Structures." Alternate designs are not acceptable unless approved by the Department.

Provide properly fitting components. Provide round, octagonal (8-sided), or dodecagonal (12-sided) pole shafts tapered to the heights shown on the plans.

Permanently mark, at a visible location when erected, ITS pole base plates with the design wind speed. Locate the handholes, as shown on the plans, opposite of the direction of traffic flow.

Permanently mark, at a visible location when erected, ITS pole base plates with the fabrication plant's insignia or trademark. Place the mark on the pole base plate adjacent to the handhole access compartment.

Provide circumferential welds only at the ends of the shaft. Provide no more than 2 longitudinal seam welds in shaft sections. Grind or smooth the exterior of longitudinal seam welds to the same appearance as other shaft surfaces. Ensure 100% penetration within 6 in. of circumferential base welds and 60% minimum penetration at other locations along the longitudinal seam welds. Use a welding technique that minimizes acid entrapment during later galvanizing. Hot-dip galvanize all fabricated parts in accordance with Item 445, "Galvanizing."

Fabricate air terminal and bracket assembly to serve as a lightning arrestor in accordance with ITS pole air terminal details and IEEE standards for lightning protection. Bond air terminal with air terminal bracket via clad weld or other approved bolted connection.

- 3.3. **Cabinet.** Continuously weld all exterior seams for cabinet and doors. Fill edges to a radius of 0.03125 in. minimum. Smooth exterior welds.

Welding on aluminum cabinets are done by the gas metal arc (MIG) or gas tungsten arc (TIG) process using bare aluminum welding electrodes. Ensure electrodes conform to the requirements of the American Welding Society (AWS) A5.10 for ER5356 aluminum alloy bare welding electrodes.

Procedures, welding machines and welding machine operators for welding on aluminum must be qualified and conform with the requirements of AWS B3.0, "Welding Procedures and Performance Qualification", and to the practices recommended in AWS C5.6.

Construct all cabinets of welded sheet aluminum with a thickness of at least 0.125 in. meeting NEMA 3R standards. Do not allow wood, wood fiber product, or flammable products in the cabinet. Seal cabinet structure to prevent the entry of rain, dust, and dirt.

Provide a sunshield on the exterior top of the cabinet to reflect solar rays and mitigate temperature build-up inside the cabinet. Construct sunshield out of 0.125 in. thick aluminum and provide a minimum of 1.25 in. clearance above the top of cabinet secured in four locations.

Attach aluminum lifting eyes or ears to the top of the cabinet to permit lifting the cabinet with a sling. Lifting eyes may be permanently fabricated to the cabinet frame as long as they do not interfere with the construction and operation of the sunshield. Manufacturer may provide removable lifting eyes that can be removed after installation. Seal any penetrations to the cabinet exterior or sunshield after removal of lifting eyes.

Ensure cabinets conform to the requirements of ASTM designation: B209 for 5052-H32 aluminum sheet.

- 3.3.1. **Door.** Provide sturdy and torsionally rigid cabinet doors that substantially cover the full area of the cabinet access opening. Attach cabinet doors by a minimum of 2 heavy duty hinges or full length hinge. Provide stainless steel hinge pins.

Fabricate the doors and hinges to withstand a 100 lb. per vertical ft. force applied to the outer edge of the door when open without permanent deformation or impairment of the door or cabinet body when the load is removed.

Fit the cabinet doors with Number 2 Corbin locks and aluminum or chrome plated handles with a minimum 3/8 in. drive pin and a 3 point latch. Design the lock and latch so that the handles cannot be released until the lock is released. Provide a locking ring for a padlock along with a padlock. Provide 2 keys for the door and 2 keys for the padlock with each cabinet. Locate the lock clear of the arc of the handle. Keys must be removable in the locked position only. Mount locks with 2 stainless steel machine screws. Provide cabinet doors with a catch mechanism to hold the door open at 2 positions: 90° and 120°.

Fabricate the door and door stop mechanism to withstand a simulated wind load of 5 lb. per sq. ft. applied to both inside and outside surfaces without failure, permanent deformation, or compromising of door position.

Provide cabinets without auxiliary police doors.

Provide a gasket to act as a permanent and weather resistant seal at the cabinet door facing. The gasket material must be of a non-absorbent material and maintain its resiliency after long term exposure to the outdoor environment.

Provide a gasket with a minimum thickness of 0.25 in. Locate the gasket in a channel provided for this purpose either on the cabinet or on the door. An "L" bracket is acceptable instead of this channel if the gasket is fitted snugly against the bracket to insure a uniformly dust and weather resistant seal around the entire door facing.

3.3.2. **Mechanical Components.** Ensure all external screws, nuts, and locking washers are stainless steel. Do not use self-tapping screws unless specifically approved by the Engineer.

Ensure all parts are made of corrosion resistant material, such as plastic, stainless steel, aluminum or brass.

Ensure all materials used in construction are resistant to fungus growth and moisture deterioration.

Separate dissimilar metals by an inert dielectric material.

4. CONSTRUCTION

4.1. **Installation.** Locate ITS poles as shown on the plans unless otherwise directed to secure a more desirable location or to avoid conflict with utilities. Stake the ITS pole locations for verification by the Engineer.

Use established industry and utility safety practices when working near underground or overhead utilities. Consult with the appropriate utility company before beginning such work.

Construct foundations for new ITS poles in accordance with Item 416, "Drilled Shaft Foundations," and the details shown on the plans." Orient anchor bolts as shown on the plans. Install conduit per Item 618, Conduit."

Identify all items of a shipment with a weatherproof tag. This tag minimally must identify manufacturer, contract number, and date and destination of shipment.

Erect poles after foundation concrete has attained its design strength as required on the plans and Item 421, "Hydraulic Cement Concrete." Coat anchor bolt threads and tighten anchor bolts in accordance with Item 449, "Anchor Bolts." Do not grout between the base plate and the foundation.

Mount the pole mounted cabinet to the backside of the ITS pole, with door either parallel or perpendicular to the roadway, away from the direction of traffic flow, as shown on the plans. Mount cabinet plumb in all directions.

For ITS pole sites located on slopes greater than 4H:1V, mount the pole mounted cabinet to the backside of the ITS pole, from the perspective parallel to the roadway with the door facing the direction of traffic flow as shown on the plans.

Install grounding conductor from cabinet and ITS pole air terminal inside a minimum 1 in. PVC conduit within the foundation. Bond grounding conductors to the primary ground rod as part of the grounding ring in accordance with the ITS grounding details.

Construct reinforced maintenance pad, when required, with Class A concrete in accordance with Item 421, "Hydraulic Cement Concrete." Provide reinforcing steel in accordance with Item 440, "Reinforcing Steel."

- 4.2. **Relocation.** Before removal of the existing pole structure or cabinet, disconnect and isolate the power cables from the electric power supply and disconnect all cables (power and communication) from the equipment and remove any ITS equipment, associated mounting brackets, pole mounted cabinet, and cabling from the pole structure. Remove existing pole structure as shown on the plans only at such time as authorized by the Engineer.

Inspect the existing pole structure, with a representative from the Department, and document any evidence of structural stress cracks or fatigue before removal. Remove and deliver to the Department, existing pole structures that fail structural inspection to an address to be supplied by the Department.

Remove the existing pole structure in a manner acceptable to the Engineer using a method that does not cause undue overstress or damage to the structure or appurtenances attached.

Use a crane of sufficient capacity to remove the pole. Disconnect and relocate the existing pole structure from and to the foundation as shown on the plans in a manner acceptable to the Engineer.

When the poles are laid down, place the poles on timber cribbing so that the poles lie reasonably straight to prevent any damage or deterioration.

Maintain safe construction and operation practices at all times. Handle the poles in such a manner during removal so as to prevent damage to the pole's exterior finish. The Contractor will be responsible for any damage to poles.

Unless otherwise shown on the plans, remove abandoned concrete foundations, including steel, to a depth of at least 2 ft. below final grade in accordance with Item 496, "Removing Structures." Backfill the excavation with materials equal in composition and density to the surrounding area. Replace any surfacing material with similar material to an equivalent condition.

Supply all new anchor bolts required for the installation of the ITS pole structure. Match bolt dimensions and lengths previously used or as shown on the plans and as directed. Provide anchor bolts in accordance with Item 449, "Anchor Bolts."

Move existing poles to the locations shown on the plans or as directed. Construct new foundations for relocated ITS poles in accordance with Item 416, "Drilled Shaft Foundations," and the details shown on the plans. Install conduit per Item 618, "Conduit." Install existing poles on new foundations in accordance with Section 4.1, "Installation." Do not grout between the base plate and foundation.

- 4.3. **Removal.** Use established industry and utility safety practices when removing poles and assemblies located near overhead or underground facilities. Consult with the appropriate utility company before beginning work.

Inspect the pole and cabinet, where included, with a representative from the Department, and remove any ITS equipment, associated mounting hardware, and cabling still attached to the pole or inside the cabinet before commencing work. Inspect the existing pole and cabinet in place, with a representative from the Department, and document any evidence of damage to the representative before removal.

Before removal of the existing pole structure or cabinet, disconnect and isolate the power cables from the electric power supply and disconnect all cables (power and communication) from the equipment. Remove and coil existing cabling to the nearest ITS ground box or as identified on the plans.

Carefully remove the cabinet from the pole structure. Avoid damage or injury to surrounding objects or individuals. Deliver the cabinet to an address to be supplied by the Department.

Carefully remove the pole from the foundation in accordance with Item 496, "Removing Structures." Avoid damage or injury to surrounding objects or individuals. Separate the pole at the slip-fitted connections, if applicable. If the pole cannot be separated, transport the complete pole or partially separate the pole to make it transportable. Deliver the pole structure to an address to be supplied by the Department.

Unless otherwise shown on the plans, remove abandoned concrete foundations, including steel, to a depth of 2 ft. below final grade in accordance with Item 496, "Removing Structures." Backfill the excavation with materials equal in composition and density to the surrounding area. Replace surfacing material with similar material to an equivalent condition.

4.4. **Testing.**

4.4.1. **Installation.** Unless otherwise shown on the plans, perform the following tests on cabinets supplied through this Item.

4.4.1.1. **Test Procedures Documentation.** Provide 5 copies of the test procedures to include tests identified in Article 4.4.2 through Article 4.4.4 inclusive and blank data forms to the Engineer for review and comment at least 45 days before testing for each test required on this project. Include the sequence of the tests in the procedures. The Engineer will comment, approve, or reject test procedures within 30 days after Contractor submittal of equipment for tests. Contractor to resubmit if necessary rejected test procedures for final approval within 10 days before testing. Review time is calendar days. Conduct all tests in accordance with the approved test procedures. The Department may witness all tests.

Record test data on the data forms and quantitative results. No bid item measurement or payment will be made until the Engineer has verified the test results meet the requirements of the specification. The data forms for all tests, except design approval tests, must be signed by an authorized representative of the Contractor.

Provide written notice to the Engineer within 48 hr. of discovery of any testing discrepancy performed in testing by the contractor. Furnish data forms containing the acceptable range of expected results and measured values.

4.4.1.2. **Design Approval Test.** Conduct a design approval test on 10% of the total number of cabinets supplied as part of the project, with at least one of each type of cabinet used on the project.

Certification from an independent testing laboratory of a successfully completed design approval test is acceptable. Ensure that the testing by this laboratory is performed in accordance with the requirements of this specification. Failure of independent tests to comply with the requirements of this specification will be grounds for rejection of any certification.

Provide a copy of the certification to the Engineer. The data forms for the design approval tests must be signed by an authorized representative (company official) of the equipment manufacturer or by an authorized representative of an independent testing facility.

Notify the Engineer 10 working days before conducting this testing. The Department may witness all the tests. Perform the following tests:

- 4.4.1.2.1. **Power Service Transients.** Provide equipment that meets the performance requirements, specified in this Item, when subjected to the power service transients as specified in NEMA TS2, Section 2.2.7.2, "Transient Tests (Power Service)", or most current version.
- 4.4.1.2.2. **Temperature and Condensation.** Provide equipment that meets the performance requirements, specified in this Item, when subjected to the following conditions in the order specified below:
- stabilize the equipment at -30°F and test as specified in NEMA TS2, Sections 2.2.7.3, "Low-Temperature Low-Voltage Tests" and 2.2.7.4, "Low-Temperature High-Voltage Tests", or most current version.
 - Allow the equipment to warm up to room temperature in an atmosphere with relative humidity of at least 40%. Operate the equipment for 2 hr., while wet, without degradation or failure.
 - Stabilize the equipment at 165°F and test as specified in NEMA TS2, Sections 2.2.7.5, "High-Temperature High Voltage Tests" and 2.2.7.6, "High-Temperature Low-Voltage Tests", or most current version.
- 4.4.1.2.3. **Relative Humidity.** Provide equipment that meets the performance requirements, specified in this Item, within 30 min. of being subjected to a temperature of 165°F and a relative humidity of 18% for 48 hr.
- 4.4.1.2.4. **Vibration.** Provide equipment that shows no degradation of mechanical structure, soldered components, or plug-in components and will operate in accordance with the manufacturer's equipment specifications after being subjected to the vibration tests as described in NEMA TS2, Section 2.2.8, "Vibration Test", or most current version.
- 4.4.1.2.5. **Power Interruption.** Provide equipment that meets the performance requirements, specified in this Item, when subjected to nominal input voltage variations as specified in NEMA TS2, Section 2.2.10, "Power Interruption Test", or most current version.
- 4.4.1.3. **Stand-Alone Tests.** Conduct a Stand-Alone Test for each cabinet after installation. Exercise all stand-alone (non-network) functional operations consisting of the following, at a minimum:
- 19-inch EIA rack,
 - adjustable shelves,
 - locking mechanism,
 - fan and thermostat,
 - cabinet light,
 - back panel,
 - circuit breakers,
 - surge protection,
 - grounding system,
 - terminal strips,
 - interconnect harnesses with connectors,
 - cabinet attachment to pole,
 - weatherproofing, and
 - "Door Open" connection to back panel.

Notify the Engineer 5 working days before conducting this test. The Engineer may witness all the tests.

- 4.4.1.4. **Consequences of Test Failure.** If a unit fails a test, submit a report describing the nature of the failure and the actions taken to remedy the situation before modification or replacement of the unit. If a unit requires modification, correct the fault and then repeat the test until successfully completed. Correct minor discrepancies within 30 days of written notice to the Engineer. If a unit requires replacement, provide a new unit and then repeat the test until successfully completed. Major discrepancies that will substantially delay receipt and acceptance of the unit will be sufficient cause for rejection of the unit.

Failure to satisfy the requirements of any test is considered a defect and the equipment is subject to rejection by the Engineer. The rejected equipment may be offered again for retest provided all noncompliance has been corrected.

If a failure pattern develops in similar units within the system, implement corrective measures, including modification or replacement of units, to all similar units within the system as directed. Perform the corrective measures within 30 calendar days without additional cost or extension of the contract period.

4.4.1.4.1. **Consequences of Design Approval Test Failure.** If the equipment fails the design approval test, correct the fault within 30 days and then repeat the design approval test until successfully completed.

4.4.1.4.2. **Consequences of Stand-Alone Test Failure.** If the equipment fails the stand-alone test, correct the fault within 30 days and then repeat the stand-alone test until successfully completed.

4.4.2. **Relocation.**

4.4.2.1. **Pre-Test.** Conduct performance testing before removal of ITS pole mounted cabinet. Test the following components or equipment, at a minimum, and document functional operations in the presence of representatives of the Contractor and the Department.

- locking mechanism,
- fan and thermostat,
- cabinet light,
- back panel,
- circuit breakers,
- surge protection system,
- grounding system, and
- "Door Open" connection to back panel.

Ensure that both representatives sign the test report indicating that the equipment has passed or failed each function. Once removed, the equipment becomes the responsibility of the Contractor until accepted by the State. Compare test data before removal and test data after installation.

4.4.2.2. **Post Test.** Testing of the ITS pole mounted cabinet is for the purpose of relieving the Contractor of maintenance of the system. The Contractor will be relieved of the responsibility for maintenance of the system in accordance with Item 7, "Legal Relations and Responsibilities", after a successful test period. The Contractor will not be required to pay for electrical energy consumed by the system.

After all existing ITS equipment has been installed, perform the same functional operation test described under Article 4.4.2.1. Furnish test data forms containing the sequence of tests including all of the data taken and quantitative results for all tests. Submit the test data forms to the Engineer at least 30 days before the day the tests are to begin. Obtain Engineer's approval of test procedures before submission of equipment for tests. Send at least 1 copy of the data forms to the Engineer.

The performance test results after relocation must be equal to or better than the test results before removal. Repair or replace those components within the system which failed after relocation but which passed before removal.

The Department will conduct approved ITS equipment system tests on the field equipment hardware with the central equipment. The tests will, as a minimum, exercise all remote control functions and display the return status codes from the controller.

If any unit fails to pass a test, prepare a report and deliver it to the Engineer. Describe in the report the nature of the failure and the corrective action needed. If the failure is the result of improper installation or damage during reinstallation, reinstall or replace the unit and repeat the test until the unit passes successfully, at no additional cost to the Department or extension of the contract period.

4.5. **Documentation.** Submit documentation for this Item consisting of the following:

4.5.1. **ITS Pole.** Shop drawings should clearly detail the following for the ITS poles submitted for the project:

- physical pole drawings,
- anchor bolts,
- material list,
- lightning suppression,
- weatherheads,
- cabinet Mounting attachments (when cabinet required), and
- grounding system.

4.5.2. **Pole Mounted Cabinet.** Shop drawings should clearly detail the following for ITS pole mounted cabinets when required as shown on the plans:

- dimensions,
- shelves,
- door,
- gasket,
- door look,
- materials list,
- exterior finish,
- ventilation,
- terminal strips,
- harnesses,
- filter,
- power distribution panel,
- surge suppression,
- back panel,
- outlets,
- circuit breakers,
- power cable terminals,
- wiring diagrams,
- cabinet grounding,
- environmental parameters, and
- connectors.

Submit shop drawings, signed, sealed, and dated by a registered professional Engineer in Texas showing the fabrication and erection details for each ITS pole including the ITS cabinet and mounting details in accordance with Item 5, "Control of the Work".

Provide at least 2 complete sets of operation and maintenance manuals in hard copy format in addition to a CD/DVD or removable flash drive that include the following:

- complete and accurate schematic diagrams,
- complete installation procedures,
- complete performance specifications (functional, electrical, mechanical and environmental) on the unit,
- complete parts list including names of vendors for parts not identified by universal part number such as JEDEC, RETMA, or EIA,
- pictorial of component layout on circuit board,
- complete maintenance and trouble-shooting procedures,
- complete stage-by-stage explanation of circuit theory and operation,
- recovery procedures for malfunction, and
- instructions for gathering maintenance assistance from manufacturer.

Identify material which is copyrighted or proprietary in nature as part of the documentation submittal. The Department will take proper provisions to secure such material and not distribute without written approval.

Provide Department with certification documentation verifying conformance with environmental and testing requirements contained in the special specification. Certifications may be provided by the manufacturer or through independent labs.

4.6. **Warranty.** The start date of the manufacturer's standard warranty will begin when the stand-alone test plan has been approved. Any equipment with less than 95% of its warranty remaining at the beginning of the stand-alone test will not be accepted by the Department. Guarantee that equipment furnished and installed

for this project performs according to the manufacturer's published specifications. Warrant the equipment against defects or failure in design, materials, and workmanship for a minimum of 5 years or in accordance with the manufacturer's standard warranty if warranty period is greater. Assign, to the Department, all manufacturer's normal warranties or guarantees on all electronic, electrical, and mechanical equipment, materials, technical data, and products furnished for and installed on the project. Repair or replace, at the manufacturer's option, defective equipment during the warranty period at no cost to the Department.

Repair or replace equipment at the Contractor's expense before beginning testing in the event of a malfunction or failure. Furnish replacement parts for all equipment within 30 days of notification of failure by the Department.

5. MEASUREMENT

This Item will be measured as each unit furnished, installed, relocated, or removed as shown on the plans, excluding new foundations and conduit.

6. PAYMENT

- 6.1. **Furnish and Install.** The work performed and materials furnished in accordance with this Item and measured as provided for under "Measurement" will be paid for at the unit price bid for "ITS Pole" of the type and height specified, including COSS/OSB extension, and "ITS Pole Mount Cabinet" of the type and configuration specified. This price is full compensation for furnishing, fabricating, and erecting ITS pole structures as shown on the plans; for furnishing, fabricating, and installing ITS pole mounted cabinets as shown on the plans; for furnishing and placing anchor bolts, nuts, washers, and templates; conducting cabinet testing; and equipment, materials, labor, tools, and incidentals necessary to provide an ITS pole structure or pole mounted cabinet complete in place and ready for the attachment of ITS equipment.

New drill shaft foundations will be paid for under Item 416, "Drilled Shaft Foundations." New conduit will be paid for under Item 618, "Conduit."

- 6.2. **Install Only.** The work performed and materials furnished in accordance with this Item and measured as provided for under "Measurement" will be paid for at the unit price bid for "ITS Pole (Install Only)" of the type and height specified, including COSS/OSB extension, and "ITS Pole Mount Cabinet (Install Only)" of the type and configuration specified. This price is full compensation for erecting ITS pole structures and installing ITS pole mounted cabinets furnished by the Department as shown on the plans; for installing and placing anchor bolts, nuts, washers, and templates; conducting cabinet testing; and equipment, materials, labor, tools, and incidentals necessary to provide an ITS pole structure or pole mounted cabinet, complete in place, and ready for the attachment of ITS equipment.

New drill shaft foundations will be paid for under Item 416, "Drilled Shaft Foundations." New conduit will be paid for under Item 618, "Conduit."

- 6.3. **Relocate.** The work performed and materials furnished in accordance with this Item and measured as provided for under "Measurement" will be paid for at the unit price bid for "ITS Pole (Relocate)" of the type and height specified, including COSS/OSB extension, and "ITS Pole Mount Cabinet (Relocate)" of the type and configuration specified. This price is full compensation for removing existing ITS pole structures or pole mounted cabinets as shown on the plans; removing existing foundations; backfilling and surface placement; hauling and erecting ITS pole structures; hauling and installing ITS pole mounted cabinets; furnishing and placing anchor bolts, nuts, washers, and templates; conducting cabinet testing; and equipment, materials, labor, tools, and incidentals necessary to relocate existing ITS pole structures or pole mounted cabinets, complete in place, and ready for the attachment of ITS equipment.

New drill shaft foundations will be paid for under Item 416, "Drilled Shaft Foundations." New conduit will be paid for under Item 618, "Conduit."

- 6.4. **Remove.** The work performed and materials furnished in accordance with this Item and measured as provided for under "Measurement" will be paid for at the unit price bid for "ITS Pole (Remove)" of the type and height specified, including COSS/OSB extension, and "ITS Pole Mount Cabinet (Remove)" of the type and configuration specified. This price is full compensation for removing existing ITS pole structures and pole mounted cabinets as shown on the plans; removing existing foundations; backfilling and surface placement; loading and hauling; and equipment; materials, labor, tools, and incidentals necessary to complete the removal of existing ITS pole structures and pole mounted cabinets.



CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

December 14, 2022
AGENDA ITEM #7

Approve additional funding to extend
the agreement with Robert Half
International, Inc. for Interim
Controller services

Strategic Plan Relevance:	Stewardship
Department:	Finance
Contact:	José Hernández, Chief Financial Officer
Associated Costs:	Not to exceed \$150,000
Funding Source:	Operating Fund
Action Requested:	Consider and act on draft resolution

Project Description/Background: On October 5, 2022, the Controller for the Mobility Authority resigned. Following the Controller's departure and due to the Mobility Authority's immediate need for a temporary replacement, with the consent of the Executive Director the Chief Financial Officer (CFO) contacted five professional services employment agencies to identify a qualified interim Controller candidate. After reviewing qualifications and interviewing prospective candidates, the CFO and Executive Director opted to move forward with an interim Controller provided through Robert Half Talent Solutions.

Previous Actions & Brief History of the Program/Project: The Mobility Authority Policy Code allows for the Executive Director to enter into an agreement for general goods and services in an amount not to exceed \$50,000. The Authority received a Statement of Work (SOW) for the Interim Controller services from Robert Half and the Executive Director entered into an agreement on November 4, 2022 for these services until a permanent Controller can be recruited.

Financing: Operating Fund

Action requested/Staff Recommendation: Given the uncertainty surrounding the timing for the recruitment of a permanent Controller, the Authority staff would like to

extend the length of time the services of the Interim Controller will be available through Robert Half. Currently, staff anticipates the \$50,000 threshold the Executive Director has authority for under the Policy Code will be reached by or before the end of January 2023.

To continue with the Interim Controller services provided by Robert Half beyond the Executive Director's \$50,000 of expenditure authority requires funding in an additional amount up to \$100,000. In aggregate the expense related to the agreement with Robert Half for Interim Controller services will not exceed \$150,000. This action would be consistent with the state law provisions of the Professional Services Procurement Act. Approval of this request will allow for the continuity of Interim Controller services until a permanent Controller is hired and commences employment.

Backup provided: Draft Resolution

**GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY**

RESOLUTION NO. 22-0XX

**APPROVING ADDITIONAL FUNDING TO EXTEND THE AGREEMENT WITH
ROBERT HALF INTERNATIONAL, INC. FOR INTERIM CONTROLLER SERVICES**

WHEREAS, the Mobility Authority’s controller resigned on October 5, 2022; and

WHEREAS, pursuant Mobility Authority Policy Code §401.002(a), the Executive Director may procure consulting services in an amount not to exceed \$50,000; and

WHEREAS, pending the hiring of a permanent replacement and in order to satisfy the Mobility Authority’s immediate need for a controller, on November 4, 2022, the Executive Director entered into an agreement with Robert Half International, Inc. for interim controller services (the “Agreement”); and

WHEREAS, the Executive Director currently anticipates that a new controller will not be hired prior to January 2023 when the initial \$50,000 in funding for the Agreement will be depleted; and

WHEREAS, the Executive Director requests the Board authorize an additional \$100,000 in funding to extend the Agreement until a new controller is hired.

NOW THEREFORE, BE IT RESOLVED, that the Board hereby authorizes the Executive Director to expend up to an additional \$100,000 to extend the agreement with Robert Half International, Inc. for interim controller services until a new controller is hired.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 14th day of December 2022.

Submitted and reviewed by:

Approved:

James M. Bass
Executive Director

Robert W. Jenkins, Jr.
Chairman, Board of Directors



CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

December 14, 2022
AGENDA ITEM #8

Accept the financial statements for
September 2022 and October 2022

Strategic Plan Relevance: Stewardship
Department: Finance
Contact: José Hernández, Chief Financial Officer
Associated Costs: N/A
Funding Source: N/A
Action Requested: Consider and act on draft resolution

Project Description/Background: Presentation and acceptance of the financial statements for September 2022 and October 2022.

Previous Actions & Brief History of the Program/Project: N/A

Financing: N/A

Action requested/Staff Recommendation: Accept the financial statements for September 2022 and October 2022.

Backup provided: Draft Resolution
Draft financial statements for September 2022 and
October 2022

**MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY**

RESOLUTION NO. 22-0XX

**ACCEPT THE FINANCIAL STATEMENTS FOR SEPTEMBER 2022
AND OCTOBER 2022**

WHEREAS, the Central Texas Regional Mobility Authority (Mobility Authority) is empowered to procure such goods and services as it deems necessary to assist with its operations and to study and develop potential transportation projects, and is responsible to insure accurate financial records are maintained using sound and acceptable financial practices; and

WHEREAS, close scrutiny of the Mobility Authority's expenditures for goods and services, including those related to project development, as well as close scrutiny of the Mobility Authority's financial condition and records is the responsibility of the Board and its designees through procedures the Board may implement from time to time; and

WHEREAS, the Board has adopted policies and procedures intended to provide strong fiscal oversight and which authorize the Executive Director, working with the Mobility Authority's Chief Financial Officer, to review invoices, approve disbursements, and prepare and maintain accurate financial records and reports; and

WHEREAS, the Executive Director, working with the Chief Financial Officer, has reviewed and authorized the disbursements necessary for the month of September 2022 and has caused unaudited financial statements to be prepared and attached to this resolution as Exhibit A; and

WHEREAS, the Executive Director, working with the Chief Financial Officer, has reviewed and authorized the disbursements necessary for the month of October 2022 and has caused financial statements to be prepared and attached to this resolution as Exhibit B.

NOW THEREFORE, BE IT RESOLVED, that the Board of Directors accepts the unaudited financial statements for September 2022 and financial statements for October 2022, attached hereto as Exhibit A and Exhibit B, respectively.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 14th day of December 2022.

Submitted and reviewed by:

Approved:

James M. Bass
Executive Director

Robert W. Jenkins, Jr.
Chairman, Board of Directors

Exhibit A

Financial Statements for September 2022

Central Texas Regional Mobility Authority
Income Statement
For the Period Ending September 30, 2022

	Budget Amount FY 2023	Actual Year to Date	Percent of Budget	Actual Prior Year to Date
REVENUE				
Operating Revenue				
Toll Revenue - Tags	119,610,800	31,895,518	26.67%	27,412,536
Video Tolls	46,743,300	15,225,743	32.57%	9,883,492
Fee Revenue	13,845,900	2,655,696	19.18%	3,405,970
Total Operating Revenue	180,200,000	49,776,957	27.62%	40,701,998
Other Revenue				
Interest Income	3,190,301	3,701,969	116.04%	56,155
Grant Revenue	1,359,833	-	-	20,995
Misc Revenue	130,000	10,436	8.03%	58,813
Gain/Loss on Sale of Asset	-	-	-	6,568
Total Other Revenue	4,680,134	3,712,405	79.32%	142,531
TOTAL REVENUE	\$184,880,134	\$53,489,362	28.93%	40,844,529
EXPENSES				
Salaries and Benefits				
Salary Expense-Regular	4,621,321	783,682	16.96%	901,020
Salary Reserve	80,000	-	-	-
TCDRS	1,046,269	150,288	14.36%	259,556
FICA	232,304	37,282	16.05%	45,474
FICA MED	67,009	11,306	16.87%	14,263
Health Insurance Expense	580,271	93,100	16.04%	98,873
Life Insurance Expense	5,972	1,088	18.22%	1,620
Auto Allowance Expense	10,200	1,913	18.75%	2,125
Other Benefits	126,590	18,599	14.69%	25,305
Unemployment Taxes	4,608	30	0.65%	3,509
Total Salaries and Benefits	6,774,544	1,097,287	16.20%	1,351,745

Administrative

Administrative and Office Expenses

Accounting	9,500	2,093	22.03%	2,004
Auditing	190,000	107,531	56.60%	100,975
Financial Advisors	108,000	54,000	50.00%	-
Human Resources	30,000	595	1.98%	507
Legal	70,000	1,770	2.53%	-
IT Services	350,000	48,662	13.90%	33,095
Internet	150	-	-	-
Software Licenses	557,500	31,051	5.57%	116,141
Cell Phones	24,200	3,027	12.51%	4,627
Local Telephone Service	10,000	25,261	252.61%	22,154
Overnight Delivery Services	250	40	16.06%	44
Copy Machine	15,500	3,816	24.62%	2,544
Repair & Maintenance-General	8,000	-	-	-
Meeting Expense	12,750	4,005	31.42%	230
Toll Tag Expense	3,000	100	3.33%	340
Parking / Local Ride Share	2,800	275	9.81%	-
Mileage Reimbursement	3,950	557	14.10%	50
Insurance Expense	651,250	128,063	19.66%	154,359
Rent Expense	731,203	192,325	26.30%	126,886
Building Parking	3,500	425	12.14%	74
Legal Services	443,000	340	0.08%	29,029
Total Administrative and Office Expenses	3,224,553	603,936	18.73%	593,059

Office Supplies

Books & Publications	3,250	615	18.93%	292
Office Supplies	7,750	1,163	15.01%	582
Misc Office Equipment	4,500	-	-	630
Computer Supplies	221,950	132,296	59.61%	9,045
Other Reports-Printing	5,000	-	-	-
Office Supplies-Printed	3,100	668	21.54%	-
Postage Expense	550	122	22.20%	112
Total Office Supplies	246,100	134,864	54.80%	10,660

Communications and Public Relations

Graphic Design Services	75,000	-	-	-
Website Maintenance	111,500	23,692	21.25%	19,479
Research Services	140,000	-	-	10,109
Communications and Marketing	400,000	-	-	12,827
Advertising Expense	500,000	56,551	11.31%	65,263
Direct Mail	65,000	-	-	-
Video Production	82,500	28,359	34.37%	8,820
Photography	25,000	450	1.80%	199
Radio	50,000	-	-	-
Other Public Relations	2,500	-	-	-
Promotional Items	520,000	7,656	1.47%	-
Annual Report printing	1,500	-	-	780
Direct Mail Printing	26,000	-	-	-
Other Communication Expenses	15,000	17,703	118.02%	11,040
Total Communications and Public Relations	2,014,000	134,411	6.67%	128,515

Employee Development

Subscriptions	50,700	264	0.52%	123
Agency Memberships	78,550	1,200	1.53%	150
Continuing Education	4,800	-	-	50
Professional Development	19,150	375	1.96%	-
Other Licenses	1,900	497	26.15%	375
Seminars and Conferences	118,500	35,310	29.80%	1,350
Travel	93,500	30	0.03%	-
Total Employee Development	367,100	37,676	10.26%	2,048

Financing and Banking Fees

Trustee Fees	60,000	36,000	60.00%	11,463
Bank Fee Expense	3,240	273	8.41%	917
Continuing Disclosure	7,000	-	-	-
Arbitrage Rebate Calculation	15,000	16,300	108.67%	-
Rating Agency Expense	50,000	31,000	62.00%	-
Total Financing and Banking Fees	135,240	83,573	61.80%	12,380

Total Administrative **5,986,993** **994,459** **16.61%** **746,662**

Operations and Maintenance

Operations and Maintenance Consulting

GEC-Trust Indenture Support	763,997	281,928	36.90%	278,936
GEC-Financial Planning Support	275,000	66,422	24.15%	43,747
GEC-Toll Ops Support	2,550,000	154,812	6.07%	247,468
GEC-Roadway Ops Support	1,411,139	115,749	8.20%	102,304
GEC-Technology Support	654,369	158,806	24.27%	251,641
GEC-Public Information Support	200,000	46,308	23.15%	51,158
GEC-General Support	1,360,000	198,789	14.62%	277,048
General System Consultant	1,159,640	307,054	26.48%	256,823
Traffic Modeling	150,000	-	-	91,842
Traffic and Revenue Consultant	500,000	162,641	32.53%	191,735
Total Operations and Maintenance Consulting	9,024,145	1,492,507	16.54%	1,792,702

Roadway Operations and Maintenance

Roadway Maintenance	1,868,052	1,065,486	57.04%	447,463
Landscape Maintenance	2,949,320	1,315,369	44.60%	599,145
Maintenance Supplies-Roadway	300,000	-	-	26,100
Tools & Equipment Expense	25,000	444	1.78%	-
Gasoline	30,000	5,112	17.04%	3,714
Repair & Maintenance - Vehicles	10,000	674	6.74%	369
Natural Gas	2,500	1,285	51.40%	1,100
Electricity - Roadways	250,000	63,807	25.52%	40,389
Total Roadway Operations and Maintenance	5,434,872	2,452,178	45.12%	1,118,279

Toll Processing and Collection Expense

Image Processing	4,208,340	1,023,675	24.32%	931,654
Tag Collection Fees	8,453,846	2,361,248	27.93%	1,933,623
Court Enforcement Costs	10,000	-	-	-
DMV Lookup Fees	200	-	-	-
Total Processing and Collection Expense	12,672,387	3,384,923	26.71%	2,865,277

Toll Operations Expense

Generator Fuel	3,000	-	-	-
Fire and Burglar Alarm	500	123	24.67%	123
Refuse	2,180	640	29.37%	393
Water - Irrigation	7,500	3,082	41.09%	1,289
Electricity	500	111	22.17%	186
ETC spare parts expense	200,000	-	-	-
Repair & Maintenance Toll Equip	50,000	31,491	62.98%	-
Law Enforcement	500,000	106,434	21.29%	50,950
ETC Maintenance Contract	6,000,000	666,601	11.11%	43,900
Transaction Processing Maintenance Contract	1,500,000	-	-	-
ETC Toll Management Center System Operation	875,000	134,510	15.37%	37,500
ETC Development	559,000	2,759	0.49%	109,881
ETC Testing	275,000	-	-	-
Total Toll Operations Expense	9,972,680	945,752	9.48%	244,222

Total Operations and Maintenance 37,104,083 8,275,359 22.30% 6,020,480

Other Expenses

Special Projects and Contingencies

HERO	149,000	36,957	24.80%	36,957
Special Projects	100,000	-	-	-
71 Express Net Revenue Payment	5,000,000	1,324,641	26.49%	1,101,925
Customer Relations	3,000	-	-	-
Technology Initiatives	75,000	-	-	10,279
Other Contractual Svcs	370,000	75,500	20.41%	59,500
Contingency	300,000	-	-	-
Total Special Projects and Contingencies	5,997,000	1,437,098	23.96%	1,208,661

Non Cash Expenses

Amortization Expense	2,020,950	320,073	15.84%	349,778
Amort Expense - Refund Savings	9,073,105	1,330,277	14.66%	678,856
Dep Exp - Furniture & Fixtures	2,178	653	30.00%	653
Dep Expense - Equipment	-	-	-	625
Dep Expense - Autos & Trucks	46,496	13,338	28.69%	5,735
Dep Expense - Buildng & Toll Fac	176,748	44,187	25.00%	44,187
Dep Expense - Highways & Bridges	53,479,102	12,655,386	23.66%	12,655,386
Dep Expense - Toll Equipment	4,736,604	1,035,778	21.87%	1,018,608
Dep Expense - Signs	1,052,717	254,143	24.14%	254,143
Dep Expense - Land Improvements	884,934	221,234	25.00%	221,234
Depreciation Expense - Computers	64,319	47,270	73.49%	47,270
Total Non Cash Expenses	71,537,153	15,922,338	22.26%	15,276,476

Total Other Expenses 77,534,153 17,359,437 22.39% 16,485,137

Non Operating Expenses

Bond Issuance Expense	1,250,000	132,074	10.57%	331,120
Loan Fee Expense	14,500	-	-	-
Interest Expense	83,664,454	19,504,907	23.31%	20,560,802
CAMPO RIF Payment	-	-	-	5,000,000
Community Initiatives	150,000	-	-	17,550
Total Non Operating Expenses	\$85,078,954	\$19,636,981	23.08%	\$25,909,472
<hr/>				
TOTAL EXPENSES	212,478,727	47,363,523	22.29%	50,513,496
Net Income	\$ (27,598,593)	\$ 6,125,839		\$ (9,668,967)

Central Texas Regional Mobility Authority
Balance Sheet
as of September 30, 2022

	as of 09/30/2022	as of 09/30/2021
ASSETS		
Current Assets		
Cash		
Regions Operating Account	\$ 3,518,183	\$ 1,234,218
Cash in TexStar	42,930	1,040,217
Regions Payroll Account	99,387	149,919
Restricted Cash		
Goldman Sachs FSGF 465	1,103,383,771	542,367,543
Restricted Cash - TexSTAR	10,409,892	151,866,879
Overpayments account	291,108	626,619
Total Cash and Cash Equivalents	<u>1,117,745,271</u>	<u>697,285,393</u>
Accounts Receivable		
Accounts Receivable	2,770,089	2,770,089
Due From Other Agencies	65,805	83,228
Due From TTA	548,177	4,039,245
Due From NTTA	1,062,984	1,148,059
Due From HCTRA	2,065,183	1,593,212
Due From TxDOT	164,602	139,239
Interest Receivable	693,342	675,683
Total Receivables	<u>7,370,183</u>	<u>10,448,756</u>
Short Term Investments		
Treasuries	(0)	329,356,750
Agencies	(0)	169,282,486
Total Short Term Investments	<u>(0)</u>	<u>498,639,236</u>
Total Current Assets	<u>1,125,115,454</u>	<u>1,206,373,386</u>
Total Construction in Progress	305,998,504	211,140,943
Fixed Assets (Net of Depreciation and Amortization)		
Computers	51,237	240,318
Computer Software	1,470,864	2,311,532
Furniture and Fixtures	1,525	4,138
Equipment	9,624	119,838
Autos and Trucks	80,545	33,797
Buildings and Toll Facilities	4,372,832	4,549,579
Highways and Bridges	1,704,435,035	1,750,072,871
Toll Equipment	19,023,709	21,457,435
Signs	12,908,180	13,485,020
Land Improvements	5,978,035	6,862,969
Right of way	88,149,606	88,149,606
Leasehold Improvements	33,176	79,319
Total Fixed Assets	<u>1,836,514,366</u>	<u>1,887,366,423</u>
Other Assets		
Intangible Assets-Net	173,961,907	123,655,207
2005 Bond Insurance Costs	3,301,851	3,594,056
Deferred Outflows (pension related)	675,913	641,074
Pension Asset	2,549,818	591,247
Total Other Assets	<u>180,489,489</u>	<u>128,481,583</u>
Total Assets	<u><u>\$ 3,448,117,813</u></u>	<u><u>\$ 3,433,362,336</u></u>

Central Texas Regional Mobility Authority
Balance Sheet
as of September 30, 2022

	as of 09/30/2022	as of 09/30/2021
LIABILITIES		
Current Liabilities		
Accounts Payable	\$ 45,341,686	\$ 36,194,303
Construction Payable	5,224,340	10,022,980
Overpayments	294,629	629,946
Interest Payable	20,449,024	24,735,845
TCDRS Payable	74,574	60,707
Due to other Agencies	2,849	8,118
Due to TTA	624,134	319,374
Due to NTTA	-	83,919
Due to HCTRA	148,238	118,502
Due to Other Entities	57,776	1,104,346
71E TxDOT Obligation - ST	3,142,749	2,625,615
Total Current Liabilities	75,359,999	75,903,656
Long Term Liabilities		
Compensated Absences	268,014	285,301
Deferred Inflows (pension related)	1,481,361	109,052
Long Term Payables	1,749,375	394,353
Bonds Payable		
Senior Lien Revenue Bonds:		
Senior Lien Revenue Bonds 2010	89,266,291	82,850,936
Senior Lien Revenue Bonds 2011	19,136,793	18,857,674
Senior Refunding Bonds 2013	3,475,000	7,080,000
Senior Lien Revenue Bonds 2015	10,000,000	298,790,000
Senior Lien Refunding Revenue Bonds 2016	70,790,000	348,295,000
Senior Lien Revenue Bonds 2018	44,345,000	44,345,000
Senior Lien Revenue Bonds 2020A	50,265,000	50,265,000
Senior Lien Refunding Bonds 2020B	55,600,000	56,205,000
Senior Lien Refunding Bonds 2020C	138,435,000	138,435,000
Senior Lien Revenue Bonds 2020E	167,160,000	167,160,000
Senior Lien Revenue Bonds 2021B	255,075,000	255,075,000
Senior Lien Refunding Bonds 2021D	274,625,000	-
Senior Lien Refunding Bonds 2021E	335,610,000	-
Sn Lien Rev Bnd Prem/Disc 2013	447,279	2,236,397
Sn Lien Revenue Bnd Prem 2015	-	16,888,708
Senior Lien Premium 2016 Revenue Bonds	7,383,436	37,969,218
Sn Lien Revenue Bond Premium 2018	3,083,148	3,349,721
Senior Lien Revenue Bond Premium 2020A	11,304,305	11,441,313
Senior Lien Refunding Bond Premium 2020B	11,637,887	12,172,962
Senior Lien Revenue Bonds Premium 2020E	25,427,076	27,142,462
Senior Lien Revenue Bonds Premium 2021B	53,414,235	53,706,204
Senior Lien Refunding Bonds Premium 2021D	44,749,354	-
Total Senior Lien Revenue Bonds	1,671,229,804	1,632,265,594

Central Texas Regional Mobility Authority
Balance Sheet
as of September 30, 2022

	as of 09/30/2022	as of 09/30/2021
Sub Lien Revenue Bonds:		
Sub Lien Refunding Bonds 2013	2,725,000	5,320,000
Sub Lien Refunding Bonds 2016	72,605,000	73,055,000
Subordinated Lien BANS 2018	-	46,020,000
Sub Lien Refunding Bonds 2020D	98,580,000	99,705,000
Subordinated Lien BANS 2020F	110,875,000	110,875,000
Subordinate Lien Refunding Bonds 2020G	61,570,000	61,570,000
Subordinated Lien BANS 2021C	244,185,000	244,185,000
Sub Refunding 2013 Prem/Disc	95,437	477,185
Sub Refunding 2016 Prem/Disc	5,587,450	6,407,577
Sub Lien BANS 2018 Premium	-	(0)
Subordinated Lien BANS 2020F Premium	9,006,445	13,009,310
Subordinated Lien Refunding Bonds Premium 2020G	7,067,227	7,471,198
Sub Lien BANS 2021C Premium	32,349,629	39,961,306
Total Sub Lien Revenue Bonds	644,646,188	708,056,576
Other Obligations		
TIFIA Note 2021	353,243,889	307,045,008
71E TxDOT Obligation - LT	55,077,264	57,263,411
Regions 2017 MoPAC Note	-	24,990,900
Regions 2022 MoPac Loan	24,690,900	-
Total Other Obligations	433,012,053	389,299,319
Total Long Term Liabilities	2,750,637,420	2,730,015,842
Total Liabilities	2,825,997,419	2,805,919,498
NET ASSETS		
Contributed Capital	121,462,104	121,462,104
Net Assets Beginning	494,532,189	515,649,438
Current Year Operations	6,126,101	(9,668,704)
Total Net Assets	622,120,394	627,442,838
Total Liabilities and Net Assets	\$ 3,448,117,813	\$ 3,433,362,336

Central Texas Regional Mobility Authority
Statement of Cash Flow
as of September 2022

Cash flows from operating activities:

Receipts from toll revenues	\$	55,149,297
Payments to vendors		(11,520,977)
Payments to employees		(1,143,867)
Net cash flows provided by (used in) operating activities		42,484,453

Cash flows from capital and related financing activities:

Issuance Expense		(132,074)
Payments on bonds / loans		(300,000)
Interest payments		(39,904,215)
RIF Contribution		(5,000,000)
Acquisition of capital assets - non project		(1,815,039)
Acquisitions of construction in progress		(20,297,206)
Net cash flows provided by (used in) capital and related financing activities		(67,448,534)

Cash flows from investing activities:

Interest Receivable		2,018
Interest income		3,702,579
Purchase of investments		(21,098,870)
Proceeds from sale or maturity of investments		131,044,443
Net cash flows provided by (used in) investing activities		113,648,151
Net increase (decrease) in cash and cash equivalents		88,684,070
Cash and cash equivalents at beginning of period		1,029,061,201
Cash and cash equivalents at end of period	\$	1,117,745,271

Reconciliation of change in net assets to net cash provided by operating activities:

Operating income	\$	22,060,850
Adjustments to reconcile change in net assets to net cash provided by operating activities:		
Depreciation and amortization		15,917,980
Changes in assets and liabilities:		
(Increase) decrease in accounts receivable		4,906,690
(Increase) decrease in prepaid expenses and other assets		(128,063)
(Decrease) increase in accounts payable		(724,064)
Increase (decrease) in accrued expenses		451,059
Total adjustments		20,423,602
Net cash flows provided by (used in) operating activities	\$	42,484,453

Reconciliation of cash and cash equivalents:

Unrestricted cash and cash equivalents	\$	180,711,513
Restricted cash and cash equivalents		937,033,758
Total	\$	1,117,745,271

INVESTMENTS by FUND

		Balance September 30, 2022	
Renewal & Replacement Fund			
TexSTAR	1,805.86		TexSTAR 10,452,741.28
Goldman Sachs	40,175.84		Goldman Sachs 1,098,099,878.80
Agencies/ Treasuries		41,981.70	Agencies & Treasury Notes -
Grant Fund			\$ 1,108,552,620.08
TexSTAR	457,564.31		
Goldman Sachs	9,664,893.85		
Agencies/ Treasuries	MATURED	10,122,458.16	
Senior Debt Service Reserve Fund			
TexSTAR	993,057.18		
Goldman Sachs	107,428,216.31		
Agencies/ Treasuries	MATURED	108,421,273.49	
2010 Senior Lien Debt Service Account			
Goldman Sachs	60,945.96	60,945.96	
2011 Sr Debt Service Accountt			
Goldman Sachs	2,805,792.77	2,805,792.77	
2013 Sr Debt Service Accountt			
Goldman Sachs	2,657,603.94	2,657,603.94	
2013 Sub Debt Service Account			
Goldman Sachs	2,084,078.42	2,084,078.42	
2013 Sub Debt Service Reserve Fund			
Goldman Sachs	123.87	785,942.42	
TexSTAR	785,818.55		
2015 Sr Debt Service Account			
Goldman Sachs	4,503,001.01	4,503,001.01	
2016 Sr Lien Rev Refunding Debt Service Account			
Goldman Sachs	10,989,475.65	10,989,475.65	
2016 Sub Lien Rev Refunding Debt Service Account			
Goldman Sachs	1,704,969.70	1,704,969.70	
2016 Sub Lien Rev Refunding DSR			
Goldman Sachs	7,030,860.40	7,030,860.40	
Agencies/ Treasuries	-	-	
Operating Fund			
TexSTAR	42,849.34		
TexSTAR-Trustee	5,035,907.38		
Goldman Sachs	7,850,774.27	12,929,530.99	
Revenue Fund			
Goldman Sachs	8,808,344.27	8,808,344.27	
General Fund			
TexSTAR	1,145,928.21		
Goldman Sachs	127,144,500.92		
Agencies/ Treasuries	-	128,290,429.13	
71E Revenue Fund			
Goldman Sachs	24,133,657.79	24,133,657.79	
MoPac Revenue Fund			
Goldman Sachs	88,572.45	88,572.45	
MoPac General Fund			
Goldman Sachs	8,116,908.05	8,116,908.05	
MoPac Operating Fund			
Goldman Sachs	183,208.77	183,208.77	
MoPac Loan Repayment Fund			
Goldman Sachs	433,837.98	433,837.98	
2015B Project Account			
Goldman Sachs	42,184,855.21		
TexSTAR	352,205.25	42,537,060.46	
2015 TIFIA Project Account			
Goldman Sachs	38,558,045.36		
TexSTAR	699,711.28		
Agencies/ Treasuries	-	39,257,756.64	
2011 Sr Financial Assistance Fund			
Goldman Sachs	978,002.53	978,018.54	
TexSTAR	16.01		
2018 Sr Lien Debt Service Account			
Goldman Sachs	454,779.02	454,779.02	
2018 Sr Lien Project Cap I			
Goldman Sachs	200,753.72	200,753.72	
2018 Sr Lien Project Account			
Goldman Sachs	11,008,564.70		
TexSTAR	937,877.91	11,946,442.61	
2020A Senior Lien Debt Service Account			
Goldman Sachs	962,574.70	962,574.70	
2020B Senior Lien Debt Service Account			
Goldman Sachs	1,148,654.29	1,148,654.29	
2020C Senior Lien Debt Service Account			
Goldman Sachs	947,317.32	947,317.32	
2020D Sub Lien Debt Service Account			
Goldman Sachs	1,601,575.31	1,601,575.31	
2020D Sub Debt Service Reserve Fund			
Goldman Sachs	8,161,305.18	8,161,305.18	
2020E Senior Lien Project Account			
Goldman Sachs	152,264,706.91	152,264,706.91	
2020E Senior Lien Project Cap Interest			
Goldman Sachs	21,814,242.42	21,814,242.42	
2020F Sub Lien Project Account			
Goldman Sachs	24,870,974.64	24,870,974.64	
2020F Sub Lien Deb Service Account			
Goldman Sachs	1,389,629.39	1,389,629.39	
2020G Sub Lien Debt Service Account			
Goldman Sachs	639,849.91	639,849.91	
2020G Sub Lien Debt Service Reserve Account			
Goldman Sachs	2,755,846.98	2,755,846.98	
2021A Sub Lien Debt Service Reserve Account			
Goldman Sachs	11,619,833.05	11,619,833.05	30,353,788.03
2021A Sub Debt Service Account			
Goldman Sachs	96.22	96.22	
2021B Senior Lien Cap I Project Fund			
Goldman Sachs	46,202,998.18	46,202,998.18	
2021B Senior Lien Project Account			
Goldman Sachs	231,025,689.04		
Agencies/ Treasuries	MATURED	231,025,689.04	
2021C Sub Lien Cap I Project Fund			
Goldman Sachs	1,342.90	1,342.90	
2021C Sub Lien Project Account			
Goldman Sachs	162,630,875.32	162,630,875.32	
2021C Sub Lien Debt Service Account			
Goldman Sachs	3,059,567.40	3,059,567.40	
2021D Senior Lien Debt Service Account			
Goldman Sachs	3,169,032.81	3,169,032.81	
2021E Senior Lien Debt Service Account			
Goldman Sachs	4,718,824.07	4,718,824.07	
		\$ 1,108,552,620.08	

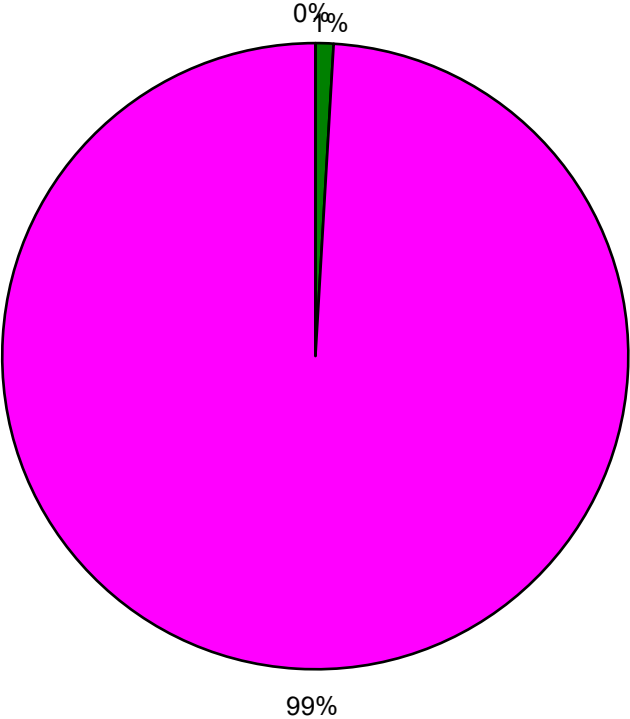
CTRMA INVESTMENT REPORT

	Month Ending 9/30/2022					Rate September	
	Balance 9/1/2022	Additions	Discount Amortization	Accrued Interest	Withdrawals		Balance 9/30/2022
Amount in Trustee TexStar							
* 2011 Sr Lien Financial Assist Fund	16.01			0.00		16.01	2.2941%
* 2013 Sub Lien Debt Service Reserve	784,339.61			1,478.94		785,818.55	2.2941%
* General Fund	1,143,771.52			2,156.69		1,145,928.21	2.2941%
* Trustee Operating Fund	5,024,502.99	4,000,000.00		11,404.39	4,000,000.00	5,035,907.38	2.2941%
* Renewal and Replacement	1,802.46			3.40		1,805.86	2.2941%
* Grant Fund	456,703.15			861.16		457,564.31	2.2941%
* Senior Lien Debt Service Reserve Fund	991,188.21			1,868.97		993,057.18	2.2941%
* 2015B Sr Ln Project	351,542.38			662.87		352,205.25	2.2941%
* 2015C TIFIA Project	698,394.40			1,316.88		699,711.28	2.2941%
* 2018 Sr Lien Project Account	936,112.77			1,765.14		937,877.91	2.2941%
	10,388,373.50	4,000,000.00		21,518.44	4,000,000.00	10,409,891.94	
Amount in TexStar Operating Fund	41,790.90	3,000,000.00		1,058.44	3,000,000.00	42,849.34	2.2941%
Goldman Sachs							
* Operating Fund	7,762,787.68	4,077,280.38		13,779.10	4,003,072.89	7,850,774.27	2.4719%
* 2020A Senior Lien Debt Service Account	862,302.19	98,815.62		1,456.89		962,574.70	2.4719%
* 2020B Senior Lien Debt Service Account	870,873.17	276,450.46		1,330.66		1,148,654.29	2.4719%
* 2020C Senior Lien Debt Service Account	631,944.03	314,498.42		874.87		947,317.32	2.4719%
* 2020D Sub Lien Debt Service Account	1,257,708.94	341,898.96		1,967.41		1,601,575.31	2.4719%
* 2020D Sub Debt Service Reserve Fund	8,146,797.25			14,507.93		8,161,305.18	2.4719%
* 2020E Sr Lien Project Account	151,994,033.76			270,673.15		152,264,706.91	2.4719%
* 2020E Sr Ln Project Cap Interest	21,775,464.36			38,778.06		21,814,242.42	2.4719%
* 2020F Sub Lien Project Account	25,518,561.50			49,935.41	697,522.27	24,870,974.64	2.4719%
* 2020F Sub Lien Debt Service Account	926,989.05	461,357.03		1,283.31		1,389,629.39	2.4719%
* 2020G Sub Lien Debt Service Account	426,828.81	212,430.20		590.90		639,849.91	2.4719%
* 2020G Sub Debt Service Reserve Fund	2,655,331.16	95,863.53		4,652.29		2,755,846.98	2.4719%
* 2021A Sub Debt Service Reserve Fund	11,052,799.07	547,787.33		19,246.65		11,619,833.05	2.4719%
* 2021A Sub Debt Service Account	96.05			0.17		96.22	2.4719%
* 2021B Senior Lien Cap I Project Fund	46,120,865.48			82,132.70		46,202,998.18	2.4719%
* 2021B Senior Lien Project Account	130,757,833.62	100,035,000.00		232,855.42		231,025,689.04	2.4719%
* 2021C Sub Lien Cap I Project Fund	1,340.51			2.39		1,342.90	2.4719%
* 2021C Sub Lien Project Account	164,155,559.36			4,281,313.84	5,805,997.88	162,630,875.32	2.4719%
* 2021C Sub Lien Debt Service Account	2,040,520.34	1,016,222.72		2,824.34		3,059,567.40	2.4719%
* 2021D Senior Lien Debt Service Account	2,192,875.27	973,027.48		3,130.06		3,169,032.81	2.4719%
* 2021E Senior Lien Debt Service Account	3,650,220.28	1,062,950.10		5,653.69		4,718,824.07	2.4719%
* 2011 Sr Financial Assistance Fund	976,263.91			1,738.62		978,002.53	2.4719%
* 2010 Senior DSF	60,837.62			108.34		60,945.96	2.4719%
* 2011 Senior Lien Debt Service Account	2,491,209.23	310,394.25		4,189.29		2,805,792.77	2.4719%
* 2013 Senior Lien Debt Service Account	2,349,967.04	303,693.80		3,943.10		2,657,603.94	2.4719%
* 2013 Sub Debt Service Reserve Fund	123.65			0.22		123.87	2.4719%
* 2013 Subordinate Debt Service Account	1,842,818.51	238,167.79		3,092.12		2,084,078.42	2.4719%
* 2015A Sr Lien Debt Service Account	4,494,995.93			8,005.08		4,503,001.01	2.4719%
* 2015B Project Account	42,109,862.26			74,992.95		42,184,855.21	2.4719%
* 2015C TIFIA Project Account	38,603,936.40			68,876.49	114,767.53	38,558,045.36	2.4719%
* 2016 Sr Lien Rev Refunding Debt Service Account	10,294,355.33	677,326.81		17,793.51		10,989,475.65	2.4719%
* 2016 Sub Lien Rev Refunding Debt Service Account	1,331,663.19	371,230.70		2,075.81		1,704,969.70	2.4719%
* 2016 Sub Lien Rev Refunding DSR	7,018,361.48			12,498.92		7,030,860.40	2.4719%
* 2018 Sr Lien Project Cap I	200,396.85			356.87		200,753.72	2.4719%
* 2018 Sr Lien Debt Service Account	302,945.38	151,414.77		418.87		454,779.02	2.4719%
* 2018 Sr Lien Project Account	11,003,962.48			19,599.59	14,997.37	11,008,564.70	2.4719%
* Grant Fund	7,206,204.66	2,445,855.75		12,833.44		9,664,893.85	2.4719%
* Renewal and Replacement	19,078.57	700,000.00		199.45	679,102.18	40,175.84	2.4719%
* Revenue Fund	8,032,736.04	18,415,085.26		13,718.00	17,653,195.03	8,808,344.27	2.4719%
* General Fund	122,880,283.68	4,788,517.40		200,345.80	724,645.96	127,144,500.92	2.4719%
* Senior Lien Debt Service Reserve Fund	97,266,783.36	10,003,500.00		157,932.95		107,428,216.31	2.4719%
* 71E Revenue Fund	23,110,368.33	1,121,935.71		40,176.43	138,822.68	24,133,657.79	2.4719%
* MoPac Revenue Fund	443,654.66	1,097,177.12		339.05	1,452,598.38	88,572.45	2.4719%
* MoPac General Fund	11,810,183.79	1,308,630.13		20,913.83	5,022,819.70	8,116,908.05	2.4719%
* MoPac Operating Fund	476,347.55	50,410.62		1,159.66	344,709.06	183,208.77	2.4719%
* MoPac Loan Repayment Fund	289,551.56	143,968.25		318.17		433,837.98	2.4719%
	977,418,623.34	151,640,890.59		5,692,615.80	36,652,250.93	1,098,099,878.80	
Amount in Fed Agencies and Treasuries							
Amortized Principal	112,444,442.74				112,444,442.74	0.00	
	112,444,442.74					0.00	
Certificates of Deposit							
Total in Pools	10,430,164.40	7,000,000.00		22,576.88	7,000,000.00	10,452,741.28	
Total in GS FSGF	977,418,623.34	151,640,890.59		5,692,615.80	36,652,250.93	1,098,099,878.80	
Total in Fed Agencies and Treasuries	112,444,442.74				112,444,442.74	0.00	
Total Invested	1,100,293,230.48	158,640,890.59		5,715,192.68	156,096,693.67	1,108,552,620.08	

All Investments in the portfolio are in compliance with the CTRMA's Investment policy and the relevant provisions of the Public Funds Investment Act Chapter 2256.023

9/30/2022

Allocation of Funds



- Total in Pools
- Total in Money Market
- Total in Fed Agencies
- Total in CD's

Amount of Investments As of September 30, 2022

Agency	CUSIP #	COST	Book Value	Market Value	Yield to Maturity	Purchased	Matures	FUND
Agency - Federal Farm Credit	3133EM5T5	MATURED	MATURED	MATURED	0.0076%	9/24/2021	9/21/2022	Grant Fund
Agency - Federal Farm Credit	3133EM5T5a	MATURED	MATURED	MATURED	0.0076%	9/24/2021	9/21/2022	Sr Lien DSR
Agency - Federal Farm Credit	3133EM5T5b	MATURED	MATURED	MATURED	0.0076%	9/24/2021	9/21/2022	2021B Sr Project
		-	-	-				

Agency	CUSIP #	COST	Cumulative Amortization	Book Value	Maturity Value	Interest Income		
						Accrued Interest	Amortization	Interest Earned
Agency - Federal Farm Credit	3133EM5T5	MATURED	MATURED	MATURED	2,445,000.00	142.63	12.11	154.74
Agency - Federal Farm Credit	3133EM5T5a	MATURED	MATURED	MATURED	10,000,000.00	583.33	(632.89)	(49.56)
Agency - Federal Farm Credit	3133EM5T5b	MATURED	MATURED	MATURED	100,000,000.00	5,833.33	495.58	6,328.91
		-	-	-	112,445,000.00	6,559.29	(125.20)	6,434.09

ESCROW FUNDS

Travis County Escrow Fund - Elroy Road

	Balance		Accrued		Balance
	9/1/2022	Additions	Interest	Withdrawals	9/30/2022
Goldman Sachs	3,774,926.04		5,083.71		3,780,009.75

Travis County Escrow Fund - Ross Road

	Balance		Accrued		Balance
	9/1/2022	Additions	Interest	Withdrawals	9/30/2022
Goldman Sachs	116,751.99		169.22		116,921.21

Travis County Escrow Fund - Old San Antonio Road

	Balance		Accrued		Balance
	9/1/2022	Additions	Interest	Withdrawals	9/30/2022
Goldman Sachs	47,302.51		66.13		47,368.64

Travis County Escrow Fund - Old Lockhart Road

	Balance		Accrued		Balance
	9/1/2022	Additions	Interest	Withdrawals	9/30/2022
Goldman Sachs	262,649.14		417.18		263,066.32

Travis County Escrow Fund - County Line Road

	Balance		Accrued		Balance
	9/1/2022	Additions	Interest	Withdrawals	9/30/2022
Goldman Sachs	324,190.50		460.32		324,650.82

Travis County Escrow Fund - South Pleasant Valley Road

	Balance		Accrued		Balance
	9/1/2022	Additions	Interest	Withdrawals	9/30/2022
Goldman Sachs	334,023.76		443.20		334,466.96

Travis County Escrow Fund - Thaxton Road

	Balance		Accrued		Balance
	9/1/2022	Additions	Interest	Withdrawals	9/30/2022
Goldman Sachs	140,807.79		187.71		140,995.50

Travis County Escrow Fund - Pearce Lane Road

	Balance		Accrued		Balance
	9/1/2022	Additions	Interest	Withdrawals	9/30/2022
Goldman Sachs	317,605.74		424.90		318,030.64



PERFORMANCE

As of September 30, 2022

Current Invested Balance	\$8,448,258,598.47
Weighted Average Maturity (1)	12 Days
Weighted Average Life (2)	48 Days
Net Asset Value	0.999510
Total Number of Participants	994
Management Fee on Invested Balance	0.06%*
Interest Distributed	\$17,014,012.43
Management Fee Collected	\$434,628.93
% of Portfolio Invested Beyond 1 Year	6.86%
Standard & Poor's Current Rating	AAAm

Rates reflect historical information and are not an indication of future performance.

September Averages

Average Invested Balance	\$8,813,500,442.00
Average Monthly Yield, on a simple basis	2.2941%
Average Weighted Maturity (1)	16 Days
Average Weighted Life (2)	43 Days

Definition of Weighted Average Maturity (1) & (2)

(1) This weighted average maturity calculation uses the SEC Rule 2a-7 definition for stated maturity for any floating rate instrument held in the portfolio to determine the weighted average maturity for the pool. This Rule specifies that a variable rate instruction to be paid in 397 calendar days or less shall be deemed to have a maturity equal to the period remaining until the next readjustment of the interest rate.
(2) This weighted average maturity calculation uses the final maturity of any floating rate instruments held in the portfolio to calculate the weighted average maturity for the pool.

The maximum management fee authorized for the TexSTAR Cash Reserve Fund is 12 basis points. This fee may be waived in full or in part in the discretion of the TexSTAR co-administrators at any time as provided for in the TexSTAR Information Statement.

NEW PARTICIPANTS

We would like to welcome the following entities who joined the TexSTAR program in September:

- * Brazoria County Municipal Utility District No. 22
- * City Park Redevelopment Authority
- * City of Sweeny

HOLIDAY REMINDER

In observance of **Columbus Day**, **TexSTAR will be closed on Monday, October 10, 2022**. All ACH transactions initiated on Friday, October 7th will settle on Tuesday, October 11th. Please plan accordingly for your liquidity needs.

In observance of **Veterans Day**, **TexSTAR will be closed on Friday, November 11, 2022**. All ACH transactions initiated on Thursday, November 10th will settle on Monday, November 14th. Please plan accordingly for your liquidity needs.

ECONOMIC COMMENTARY

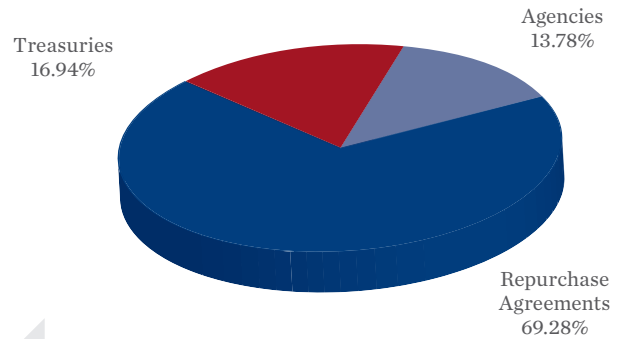
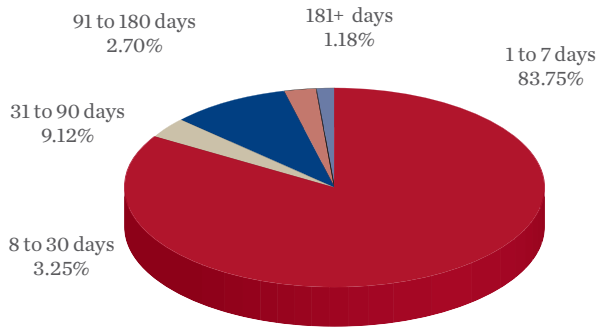
Market review

US Treasury yields continued their move higher amid stronger than expected inflation data and a more hawkish September Federal Open Market Committee (FOMC) meeting outcome, as economic data continued to show the economy losing steam despite strength in the labor market. Economic data continued to point to the risk of a recession emerging in the months ahead as a massive fiscal drag, a higher dollar and rising mortgage rates softened growth prospects. Federal Reserve (Fed) rate hikes have been effective in dragging down activity in the housing market, and September showed additional weakening in several housing indicators. With nine straight monthly declines reported for the NAHB's gauge of homebuilder sentiment, seven straight monthly declines for existing home sales, and six straight declines for single-family housing permits. With mortgage rates now approaching 7%, the drop in housing demand also appeared to be weighing on home prices. More broadly, recent purchasing managers' index (PMI) surveys pointed to the economy losing steam. The output index from the manufacturing survey averaged 49.4 over the latest three months, down from a 54.3 average over the prior three. Similarly, the activity index from the services survey averaged 46.7 over the latest three months, weakening from a 53.9 average over the prior three. Moreover, August was a soft month for real consumer spending, which grew 0.1% for the month. The saving rate remained at 3.5%, unchanged from July. Price increases appeared to be taking a toll as real personal income was down -2.3% year-over-year (y/y).

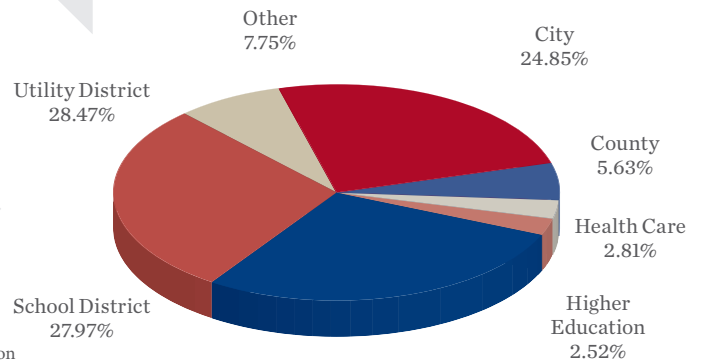
(continued page 4)

INFORMATION AT A GLANCE

PORTFOLIO BY TYPE OF INVESTMENT AS OF SEPTEMBER 30, 2022



PORTFOLIO BY MATURITY AS OF SEPTEMBER 30, 2022 (1)



DISTRIBUTION OF PARTICIPANTS BY TYPE AS OF SEPTEMBER 30, 2022

(1) Portfolio by Maturity is calculated using WAM (1) definition for stated maturity. See page 1 for definition

HISTORICAL PROGRAM INFORMATION

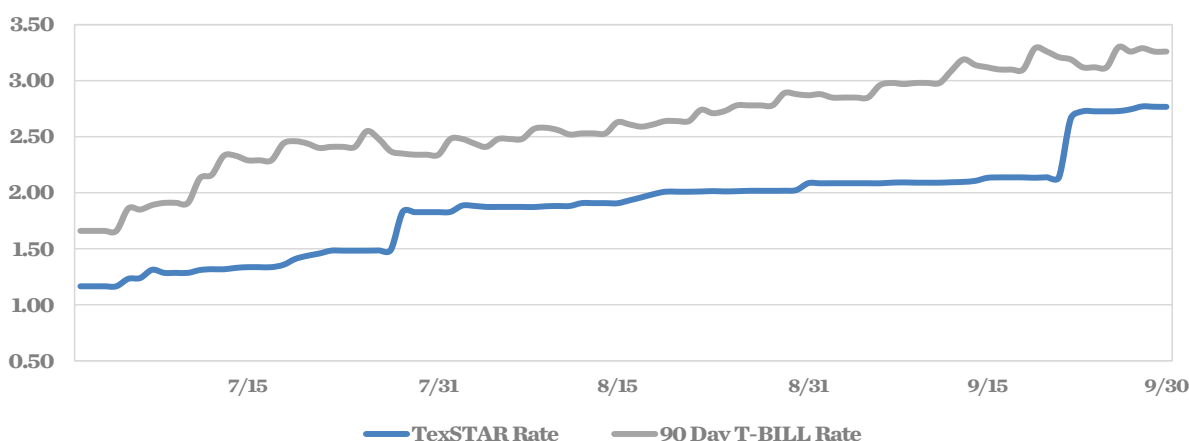
MONTH	AVERAGE RATE	BOOK VALUE	MARKET VALUE	NET ASSET VALUE	WAM (1)	WAL (2)	NUMBER OF PARTICIPANTS
Sep 22	2.2941 %	\$8,448,258,598.47	\$8,444,307,157.72	0.999510	16	43	994
Aug 22	1.9469%	8,988,292,520.61	8,983,610,837.50	0.999479	27	50	991
Jul 22	1.4010%	9,799,798,062.32	9,793,880,215.07	0.999396	34	49	990
Jun 22	0.9850%	9,799,299,684.61	9,793,062,348.93	0.999363	42	57	989
May 22	0.6459%	9,701,777,049.61	9,700,243,468.41	0.999841	43	61	988
Apr 22	0.3225%	8,985,925,505.16	8,984,338,322.90	0.999818	39	60	986
Mar 22	0.1070%	9,050,970,696.95	9,050,137,013.72	0.999907	27	38	981
Feb 22	0.0104%	9,779,113,455.23	9,778,353,196.78	0.999922	26	32	979
Jan 22	0.0100%	9,399,813,099.48	9,399,092,954.95	0.999923	31	38	977
Dec 21	0.0139%	8,763,539,414.27	8,763,577,847.71	1.000011	40	52	977
Nov 21	0.0102%	8,132,746,877.26	8,133,007,416.80	1.000032	47	62	965
Oct 21	0.0100%	8,641,191,692.82	8,641,540,291.95	1.000040	41	58	963

PORTFOLIO ASSET SUMMARY AS OF SEPTEMBER 30, 2022

	BOOK VALUE	MARKET VALUE
Uninvested Balance	\$ 564.28	\$ 564.28
Accrual of Interest Income	3,740,956.37	3,740,956.37
Interest and Management Fees Payable	(16,944,724.91)	(16,944,724.91)
Payable for Investment Purchased	0.00	0.00
Repurchase Agreement	5,861,584,999.52	5,861,584,999.52
Government Securities	2,599,876,803.21	2,595,925,362.46
TOTAL	\$ 8,448,258,598.47	\$ 8,444,307,157.72

Market value of collateral supporting the Repurchase Agreements is at least 102% of the Book Value. The portfolio is managed by J.P. Morgan Chase & Co. and the assets are safekept in a separate custodial account at the Federal Reserve Bank in the name of TexSTAR. The only source of payment to the Participants are the assets of TexSTAR. There is no secondary source of payment for the pool such as insurance or guarantee. Should you require a copy of the portfolio, please contact TexSTAR Participant Services.

TEXSTAR VERSUS 90-DAY TREASURY BILL



This material is for information purposes only. This information does not represent an offer to buy or sell a security. The above rate information is obtained from sources that are believed to be reliable; however, its accuracy or completeness may be subject to change. The TexSTAR management fee may be waived in full or in part at the discretion of the TexSTAR co-administrators and the TexSTAR rate for the period shown reflects waiver of fees. This table represents historical investment performance/return to the customer, net of fees, and is not an indication of future performance. An investment in the security is not insured or guaranteed by the Federal Deposit Insurance Corporation or any other government agency. Although the issuer seeks to preserve the value of an investment of \$1.00 per share, it is possible to lose money by investing in the security. Information about these and other program details are in the fund's Information Statement which should be read carefully before investing. The yield on the 90-Day Treasury Bill ("T-Bill Yield") is shown for comparative purposes only. When comparing the investment returns of the TexSTAR pool to the T-Bill Yield, you should know that the TexSTAR pool consists of allocations of specific diversified securities as detailed in the respective Information Statements. The T-Bill Yield is taken from Bloomberg Finance L.P. and represents the daily closing yield on the then current 90-Day T-Bill. The TexSTAR yield is calculated in accordance with regulations governing the registration of open-end management investment companies under the Investment Company Act of 1940 as promulgated from time to time by the federal Securities and Exchange Commission.

DAILY SUMMARY FOR SEPTEMBER 2022

DATE	MNY MKT FUND EQUIV. [SEC Std.]	DAILY ALLOCATION FACTOR	INVESTED BALANCE	MARKET VALUE PER SHARE	WAM DAYS (1)	WAL DAYS (2)
9/1/2022	2.0840%	0.000057096	\$8,965,804,899.79	0.999480	20	48
9/2/2022	2.0846%	0.000057113	\$8,989,650,258.51	0.999509	19	46
9/3/2022	2.0846%	0.000057113	\$8,989,650,258.51	0.999509	19	46
9/4/2022	2.0846%	0.000057113	\$8,989,650,258.51	0.999509	19	46
9/5/2022	2.0846%	0.000057113	\$8,989,650,258.51	0.999509	19	46
9/6/2022	2.0840%	0.000057095	\$8,966,612,952.72	0.999475	18	45
9/7/2022	2.0897%	0.000057253	\$8,944,783,702.21	0.999477	18	45
9/8/2022	2.0918%	0.000057310	\$8,902,465,700.46	0.999464	18	45
9/9/2022	2.0894%	0.000057245	\$8,795,357,551.98	0.999463	17	44
9/10/2022	2.0894%	0.000057245	\$8,795,357,551.98	0.999463	17	44
9/11/2022	2.0894%	0.000057245	\$8,795,357,551.98	0.999463	17	44
9/12/2022	2.0933%	0.000057350	\$8,996,839,493.69	0.999486	16	43
9/13/2022	2.0966%	0.000057441	\$9,015,054,814.24	0.999439	16	42
9/14/2022	2.1058%	0.000057694	\$9,027,560,180.02	0.999445	15	42
9/15/2022	2.1325%	0.000058424	\$8,901,803,376.22	0.999418	15	42
9/16/2022	2.1367%	0.000058540	\$8,922,337,900.88	0.999454	14	41
9/17/2022	2.1367%	0.000058540	\$8,922,337,900.88	0.999454	14	41
9/18/2022	2.1367%	0.000058540	\$8,922,337,900.88	0.999454	14	41
9/19/2022	2.1334%	0.000058448	\$8,879,526,570.08	0.999450	14	41
9/20/2022	2.1377%	0.000058566	\$8,815,603,597.81	0.999455	14	41
9/21/2022	2.1362%	0.000058527	\$8,792,302,680.89	0.999458	14	40
9/22/2022	2.6633%	0.000072968	\$8,596,862,104.97	0.999478	14	41
9/23/2022	2.7268%	0.000074708	\$8,624,169,073.84	0.999515	14	40
9/24/2022	2.7268%	0.000074708	\$8,624,169,073.84	0.999515	14	40
9/25/2022	2.7268%	0.000074708	\$8,624,169,073.84	0.999515	14	40
9/26/2022	2.7288%	0.000074761	\$8,583,332,057.51	0.999522	13	40
9/27/2022	2.7444%	0.000075189	\$8,581,989,162.67	0.999515	13	40
9/28/2022	2.7708%	0.000075912	\$8,496,977,725.93	0.999503	13	49
9/29/2022	2.7676%	0.000075825	\$8,505,041,028.06	0.999497	13	49
9/30/2022	2.7669%	0.000075805	\$8,448,258,598.47	0.999510	12	48
Average	2.2941%	0.000062853	\$8,813,500,442.00		16	43



ECONOMIC COMMENTARY (cont.)

It appears that consumers have been dipping into the “excess saving” built up from federal outlays during the pandemic to fund recent spending.

Meanwhile, inflation showed some signs of turning over but remained persistently high. Despite hopes for a slightly negative headline inflation print, the August CPI report came in above expectations as broad-based goods and services inflation offset the impact of large declines in gasoline prices. Headline CPI rose by 0.1% month-over-month (m/m) (vs. consensus -0.1%), and core CPI jumped 0.6% m/m (vs. consensus 0.3%), translating to year-over-year gains of 8.3% and 6.3%, respectively. While year-over-year CPI declined from 8.5% the previous month, core CPI increased from 5.9% in July. Similarly, the headline personal consumption expenditure (PCE) price index rose 0.3% m/m and 6.2% y/y in August, down from 6.4% y/y in July. The core PCE index increased 0.6% m/m and 4.9% y/y, up from 4.7% y/y in July. Within the CPI data, gasoline was a major source of the disinflation, but other categories impacted by commodities were slower to cool. While gasoline prices fell 10.6%, utility gas spiked 3.5% and electricity prices remain elevated. Food prices also rose, although the 0.8% increase was more modest than in recent months. Services prices continued to accelerate, with transportation services and medical care services rising 0.5% and 0.8%. However, airline fares continued to decline another -4.6% after falling -7.8% in July. Rental inflation, one of the stickiest parts of inflation, continued to firm as both tenants’ rent, and owner’s equivalent rent rose another 0.7%. Despite declines in the Manheim Used Vehicle Index, prices for used vehicles only ticked down by 0.1%, less than expected, and prices for new cars rose 0.8%.

Employment remained a bright spot. The August employment report continued to show solid job growth with a slight tick down in earnings and a modest rise in the unemployment rate driven by a healthy increase in the labor force. Non-farm payrolls rose by 315,000. While gains were broad-based across the economy, the payroll increase was slightly less impressive following downward revisions of a cumulative -107,000 to the prior two months. An unexpected, but welcome, 786,000 surge in the labor force caused the unemployment rate to increase from 3.5% to 3.7%. Meanwhile, weekly jobless claims, which peaked at 262,000 at the beginning of August, the highest level since November, declined to a low of 193,000 (the lowest since April) before rising to 219,000 during the week ending October 1, which was still low by historical standards. As anticipated, the FOMC voted unanimously to raise the federal funds rate target range by 75 basis points (bps) to 3.00%-3.25%, the highest level in almost 15 years. The committee’s tone remained hawkish given policymakers are “highly attentive” to taming inflation that runs well above its 2% target. The big news came with the committee’s forward guidance through its Summary of Economic Projections (SEP) and much more hawkish median “dot” plot. Relative to their June forecasts, the Fed now sees the federal funds rate ending 2022 at 4.4% and hitting a 4.6% terminal rate in 2023, with rates remaining restrictive until at least 2025.

Real GDP growth projections were revised down from 1.7% y/y in 4Q22 to just 0.2%, and cut to 1.2% by 4Q23, followed by a more sustainable 1.5%-2.0% through 2025. Expectations for year-over-year PCE deflator inflation for 4Q22 were revised higher with headline up to 5.4% from 5.2% and core up to 4.5% from 4.3%. The 4Q22 unemployment rate forecast was pushed up to 3.8% compared to 3.7% in June. Chair Powell’s message remained clear and consistent, stating that the Fed will need to bring the federal funds rate to a restrictive level and keep it there for some time, while stressing the potential for pain ahead and increased challenges for a soft landing. The Fed chose to not make any adjustments to its quantitative tightening plan, letting it run in the background. However, as originally planned, the pace of assets rolling off its balance sheet was stepped up in September, to a pace of USD 95 billion a month (USD 60 billion in U.S. Treasuries and USD 35 billion in mortgages).

Volatility was elevated as financial conditions tightened during the month. In this environment, the U.S. Treasury yield curve inverted further with the difference between two-year and 10-year yields widened to -45 bps as front-end U.S. Treasury yields rose more dramatically. The two-year Treasury yield increased by 78bps to end the month at 4.28%. In the money market space, the three-month Treasury bill was the outperformer, rising only 34 bps on the month to end at 3.27%, while the six-month and 12-month Treasury bill yields increased 58 bps and 48 bps to end at 3.93% and 3.99%, respectively.



ECONOMIC COMMENTARY (cont.)

Outlook

As we enter the fourth quarter, slowing economic momentum and rising interest rates have increased recession fears with sharp corrections in both equity and fixed income markets. With employment still strong, CPI has been the driver of Fed policy. Overall, core inflation continues to run hotter than we and the Fed would like, but it is important to recognize that it is on the way down to more normal levels. Commodities disinflation should continue to drive declines in prices, particularly as they spill over to other categories such as goods and transportation services. Other economic data continue to point to inflation moderating, and we expect measures tied to the auto sector and travel/tourism will be weak in the coming months. Supply chain issues broadly continue to improve as we have seen in the Fed's Global Supply Chain index, and inflation expectations from both consumers and financial participants have now rolled over. That being said, shelter inflation remains much stickier than anticipated and is going to be difficult to bring down.

Aggressive central banks have pushed front-end global yields higher. Despite these meaningful moves, front-end yields are biased to go even higher as central banks continue to focus on fighting inflation through more aggressive rate hikes. Furthermore, historically, there hasn't been a point in time when the Fed has ended its rate hiking cycle with a negative real fed funds rate. Even after the most recent increase, the real fed funds rate is still deeply negative at -5%, signaling more hikes are needed. The FOMC seems to agree, given the significant upward revisions to the dot plot at the September meeting. Unless unemployment moves materially higher or signs emerge of a deep recession, we expect the Fed to remain singularly focused on controlling inflation through further rate hikes. We currently expect another 125 bps of rate hikes this year bringing the fed funds rate to a range of 4.25%-4.50% by year-end. It is becoming more likely that the US will enter a recession in 2023 as the Fed will continue hiking rates until growth slows enough to tackle unprecedented high inflation. Importantly, we expect this recession to be driven by central bank policy rather than by over-levered consumers or corporations.

This information is an excerpt from an economic report dated September 2022 provided to TexSTAR by JP Morgan Asset Management, Inc., the investment manager of the TexSTAR pool.

TEXSTAR BOARD MEMBERS

Monte Mercer	North Central TX Council of Government	Governing Board President
David Pate	Richardson ISD	Governing Board Vice President
Anita Cothran	City of Frisco	Governing Board Treasurer
David Medanich	Hilltop Securities	Governing Board Secretary
Jennifer Novak	J.P. Morgan Asset Management	Governing Board Asst. Sec./Treas
Brett Starr	City of Irving	Advisory Board
James Mauldin	DFW Airport/Non-Participant	Advisory Board
Sandra Newby	Tarrant Regional Water Dist/Non-Participant	Advisory Board
Ron Whitehead	Qualified Non-Participant	Advisory Board

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Exhibit B

Financial Statements for October 2022

Central Texas Regional Mobility Authority
Income Statement
For the Period Ending October 31, 2022

	Budget Amount FY 2023	Actual Year to Date	Percent of Budget	Actual Prior Year to Date
REVENUE				
Operating Revenue				
Toll Revenue - Tags	119,610,800	43,053,104	35.99%	37,686,767
Video Tolls	46,743,300	20,657,532	44.19%	13,397,028
Fee Revenue	13,845,900	3,494,690	25.24%	4,740,643
Total Operating Revenue	180,200,000	67,205,326	37.29%	55,824,438
Other Revenue				
Interest Income	3,190,301	5,794,702	181.63%	274,266
Grant Revenue	1,359,833	-	-	20,995
Misc Revenue	130,000	11,235	8.64%	89,283
Gain/Loss on Sale of Asset	-	-	-	6,568
Total Other Revenue	4,680,134	5,805,937	124.05%	391,112
TOTAL REVENUE	\$184,880,134	\$73,011,263	39.49%	56,215,550
EXPENSES				
Salaries and Benefits				
Salary Expense-Regular	4,621,321	1,087,465	23.53%	1,178,187
Salary Reserve	80,000	-	-	-
TCDRS	1,046,269	209,992	20.07%	298,479
FICA	232,304	47,340	20.38%	57,846
FICA MED	67,009	16,083	24.00%	18,235
Health Insurance Expense	580,271	128,048	22.07%	131,810
Life Insurance Expense	5,972	1,608	26.92%	2,026
Auto Allowance Expense	10,200	2,763	27.08%	2,975
Other Benefits	126,590	24,307	19.20%	36,567
Unemployment Taxes	4,608	32	0.70%	3,752
Total Salaries and Benefits	6,774,544	1,517,637	22.40%	1,729,877

Administrative

Administrative and Office Expenses

Accounting	9,500	2,703	28.45%	2,923
Auditing	190,000	138,655	72.98%	100,975
Financial Advisors	108,000	72,000	66.67%	-
Human Resources	30,000	36,688	122.29%	1,837
Legal	70,000	2,655	3.79%	-
IT Services	350,000	255,865	73.10%	45,528
Internet	150	-	-	-
Software Licenses	557,500	295,351	52.98%	182,548
Cell Phones	24,200	4,753	19.64%	6,418
Local Telephone Service	10,000	32,893	328.93%	29,525
Overnight Delivery Services	250	40	16.06%	44
Copy Machine	15,500	5,088	32.83%	3,816
Repair & Maintenance-General	8,000	-	-	2,273
Meeting Expense	12,750	4,848	38.03%	230
Toll Tag Expense	3,000	200	6.67%	420
Parking / Local Ride Share	2,800	419	14.95%	-
Mileage Reimbursement	3,950	566	14.34%	59
Insurance Expense	651,250	177,557	27.26%	197,561
Rent Expense	731,203	248,026	33.92%	175,073
Building Parking	3,500	769	21.96%	207
Legal Services	443,000	107,622	24.29%	29,029
Total Administrative and Office Expenses	3,224,553	1,386,698	43.00%	778,465

Office Supplies

Books & Publications	3,250	923	28.39%	292
Office Supplies	7,750	1,252	16.15%	673
Misc Office Equipment	4,500	8,470	188.21%	669
Computer Supplies	221,950	174,741	78.73%	12,111
Other Reports-Printing	5,000	-	-	-
Office Supplies-Printed	3,100	668	21.54%	-
Postage Expense	550	122	22.20%	112
Total Office Supplies	246,100	186,175	75.65%	13,856

Communications and Public Relations

Graphic Design Services	75,000	-	-	-
Website Maintenance	111,500	34,850	31.26%	21,916
Research Services	140,000	-	-	10,109
Communications and Marketing	400,000	-	-	12,827
Advertising Expense	500,000	70,432	14.09%	85,718
Direct Mail	65,000	-	-	-
Video Production	82,500	28,359	34.37%	8,820
Photography	25,000	5,615	22.46%	199
Radio	50,000	-	-	-
Other Public Relations	2,500	-	-	-
Promotional Items	520,000	12,682	2.44%	-
Annual Report printing	1,500	-	-	780
Direct Mail Printing	26,000	-	-	-
Other Communication Expenses	15,000	18,018	120.12%	11,320
Total Communications and Public Relations	2,014,000	169,956	8.44%	151,688

Employee Development

Subscriptions	50,700	514	1.01%	123
Agency Memberships	78,550	1,360	1.73%	310
Continuing Education	4,800	-	-	185
Professional Development	19,150	375	1.96%	-
Other Licenses	1,900	497	26.15%	472
Seminars and Conferences	118,500	36,798	31.05%	2,560
Travel	93,500	1,139	1.22%	5,597
Total Employee Development	367,100	40,682	11.08%	9,247

Financing and Banking Fees

Trustee Fees	60,000	36,000	60.00%	26,513
Bank Fee Expense	3,240	361	11.15%	1,289
Continuing Disclosure	7,000	-	-	-
Arbitrage Rebate Calculation	15,000	16,300	108.67%	12,905
Rating Agency Expense	50,000	31,000	62.00%	-
Total Financing and Banking Fees	135,240	83,661	61.86%	40,706

Total Administrative **5,986,993** **1,867,173** **31.19%** **993,962**

Operations and Maintenance

Operations and Maintenance Consulting

GEC-Trust Indenture Support	763,997	416,287	54.49%	288,489
GEC-Financial Planning Support	275,000	109,015	39.64%	66,062
GEC-Toll Ops Support	2,550,000	255,148	10.01%	292,635
GEC-Roadway Ops Support	1,411,139	184,265	13.06%	179,426
GEC-Technology Support	654,369	191,782	29.31%	269,381
GEC-Public Information Support	200,000	82,661	41.33%	74,470
GEC-General Support	1,360,000	345,939	25.44%	350,241
General System Consultant	1,159,640	307,054	26.48%	416,183
Traffic Modeling	150,000	-	-	94,501
Traffic and Revenue Consultant	500,000	327,444	65.49%	166,014
Total Operations and Maintenance Consulting	9,024,145	2,219,595	24.60%	2,197,403

Roadway Operations and Maintenance

Roadway Maintenance	1,868,052	1,561,641	83.60%	303,712
Landscape Maintenance	2,949,320	1,776,434	60.23%	599,145
Maintenance Supplies-Roadway	300,000	-	-	26,100
Tools & Equipment Expense	25,000	444	1.78%	-
Gasoline	30,000	6,575	21.92%	4,702
Repair & Maintenance - Vehicles	10,000	817	8.17%	527
Natural Gas	2,500	1,798	71.90%	1,539
Electricity - Roadways	250,000	88,157	35.26%	57,017
Total Roadway Operations and Maintenance	5,434,872	3,435,866	63.22%	992,741

Toll Processing and Collection Expense

Image Processing	4,208,340	1,023,675	24.32%	1,271,568
Tag Collection Fees	8,453,846	3,185,181	37.68%	2,686,755
Court Enforcement Costs	10,000	-	-	-
DMV Lookup Fees	200	-	-	-
Total Processing and Collection Expense	12,672,387	4,208,856	33.21%	3,958,323

Toll Operations Expense

Generator Fuel	3,000	-	-	-
Fire and Burglar Alarm	500	164	32.90%	123
Refuse	2,180	803	36.84%	534
Water - Irrigation	7,500	3,511	46.82%	2,693
Electricity	500	288	57.61%	310
ETC spare parts expense	200,000	-	-	-
Repair & Maintenance Toll Equip	50,000	65,966	131.93%	-
Law Enforcement	500,000	139,774	27.95%	95,680
ETC Maintenance Contract	6,000,000	1,142,698	19.04%	43,900
Transaction Processing Maintenance Contract	1,500,000	-	-	-
ETC Toll Management Center System Operation	875,000	192,390	21.99%	75,000
ETC Development	559,000	2,759	0.49%	109,881
ETC Testing	275,000	-	-	-
Total Toll Operations Expense	9,972,680	1,548,354	15.53%	328,122

Total Operations and Maintenance 37,104,083 11,412,671 30.76% 7,476,589

Other Expenses**Special Projects and Contingencies**

HERO	149,000	49,276	33.07%	49,276
Special Projects	100,000	-	-	-
71 Express Net Revenue Payment	5,000,000	1,324,641	26.49%	1,101,925
Customer Relations	3,000	-	-	-
Technology Initiatives	75,000	43,784	58.38%	16,030
Other Contractual Svcs	370,000	91,500	24.73%	97,488
Contingency	300,000	-	-	-
Total Special Projects and Contingencies	5,997,000	1,509,202	25.17%	1,264,719

Non Cash Expenses

Amortization Expense	2,020,950	426,764	21.12%	466,371
Amort Expense - Refund Savings	9,073,105	1,773,703	19.55%	905,142
Dep Exp - Furniture & Fixtures	2,178	871	40.00%	871
Dep Expense - Equipment	-	-	-	833
Dep Expense - Autos & Trucks	46,496	17,783	38.25%	7,647
Dep Expense - Building & Toll Fac	176,748	58,916	33.33%	58,916
Dep Expense - Highways & Bridges	53,479,102	16,873,848	31.55%	16,873,848
Dep Expense - Toll Equipment	4,736,604	1,311,711	27.69%	1,358,144
Dep Expense - Signs	1,052,717	338,857	32.19%	338,857
Dep Expense - Land Improvements	884,934	294,978	33.33%	294,978
Depreciation Expense - Computers	64,319	63,027	97.99%	63,027
Total Non Cash Expenses	71,537,153	21,160,459	29.58%	20,368,634

Total Other Expenses 77,534,153 22,669,661 29.24% 21,633,354

Non Operating Expenses

Bond Issuance Expense	1,250,000	176,099	14.09%	4,641,294
Loan Fee Expense	14,500	48,000	331.03%	14,500
Interest Expense	83,664,454	26,006,517	31.08%	26,220,254
CAMPO RIF Payment	-	-	-	5,000,000
Community Initiatives	150,000	-	-	17,550

Total Non Operating Expenses	\$85,078,954	\$26,230,616	30.83%	\$35,893,598
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TOTAL EXPENSES	212,478,727	63,697,757	29.98%	67,727,380
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Net Income	\$ (27,598,593)	\$ 9,313,506		\$ (11,511,830)
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Central Texas Regional Mobility Authority
Balance Sheet
as of October 31, 2022

	as of 10/31/2022	as of 10/31/2021
ASSETS		
Current Assets		
Cash		
Regions Operating Account	\$ 2,004,014	\$ 1,589,643
Cash in TexStar	43,034	1,040,227
Regions Payroll Account	109,176	300,122
Restricted Cash		
Goldman Sachs FSGF 465	1,106,195,571	672,769,646
Restricted Cash - TexSTAR	11,437,004	9,725,069
Overpayments account	291,086	626,603
Total Cash and Cash Equivalents	<u>1,120,079,886</u>	<u>686,051,309</u>
Accounts Receivable		
Accounts Receivable	2,770,089	2,770,089
Due From Other Agencies	79,681	98,987
Due From TTA	1,968,075	4,840,356
Due From NTTA	1,255,487	1,308,344
Due From HCTRA	2,073,630	1,447,424
Due From TxDOT	-	143,751
Interest Receivable	693,342	1,404,371
Total Receivables	<u>8,840,305</u>	<u>12,013,322</u>
Short Term Investments		
Treasuries	(0)	328,897,610
Agencies	(0)	169,215,379
Total Short Term Investments	<u>(0)</u>	<u>498,112,989</u>
Total Current Assets	<u>1,128,920,191</u>	<u>1,196,177,620</u>
Total Construction in Progress	322,020,118	221,265,546
Fixed Assets (Net of Depreciation and Amortization)		
Computers	35,480	224,561
Computer Software	1,368,018	2,198,785
Furniture and Fixtures	1,307	3,920
Equipment	9,624	119,630
Autos and Trucks	76,099	31,885
Buildings and Toll Facilities	4,358,103	4,534,850
Highways and Bridges	1,700,313,614	1,749,044,770
Toll Equipment	18,831,072	21,117,899
Signs	12,839,893	13,404,125
Land Improvements	5,904,291	6,789,225
Right of way	88,149,606	88,149,606
Leasehold Improvements	29,330	75,473
Total Fixed Assets	<u>1,831,916,435</u>	<u>1,885,694,730</u>
Other Assets		
Intangible Assets-Net	173,518,481	181,838,104
2005 Bond Insurance Costs	3,257,826	3,576,263
Prepaid Insurance	539,340	466,963
Deferred Outflows (pension related)	675,913	641,074
Pension Asset	2,549,818	591,247
Total Other Assets	<u>180,541,378</u>	<u>187,113,651</u>
Total Assets	<u><u>\$ 3,463,398,122</u></u>	<u><u>\$ 3,490,251,547</u></u>

Central Texas Regional Mobility Authority
Balance Sheet
as of October 31, 2022

	as of 10/31/2022	as of 10/31/2021
LIABILITIES		
Current Liabilities		
Accounts Payable	\$ 51,172,883	\$ 38,645,793
Construction Payable	5,049,936	9,442,453
Overpayments	294,629	629,946
Interest Payable	27,265,365	30,490,513
TCDRS Payable	84,116	59,300
Due to other Agencies	6,394	12,909
Due to TTA	576,676	639,101
Due to NTTA	-	95,938
Due to HCTRA	149,173	107,826
Due to Other Entities	52,511	1,123,388
71E TxDOT Obligation - ST	3,142,749	2,625,615
Total Current Liabilities	87,794,432	83,872,784
Long Term Liabilities		
Compensated Absences	240,954	285,301
Deferred Inflows (pension related)	1,481,361	109,052
Long Term Payables	1,722,315	394,353
Bonds Payable		
Senior Lien Revenue Bonds:		
Senior Lien Revenue Bonds 2010	89,821,037	83,365,799
Senior Lien Revenue Bonds 2011	19,235,746	18,954,896
Senior Refunding Bonds 2013	3,475,000	7,080,000
Senior Lien Revenue Bonds 2015	10,000,000	10,000,000
Senior Lien Refunding Revenue Bonds 2016	70,790,000	81,395,000
Senior Lien Revenue Bonds 2018	44,345,000	44,345,000
Senior Lien Revenue Bonds 2020A	50,265,000	50,265,000
Senior Lien Refunding Bonds 2020B	55,600,000	56,205,000
Senior Lien Refunding Bonds 2020C	138,435,000	138,435,000
Senior Lien Revenue Bonds 2020E	167,160,000	167,160,000
Senior Lien Revenue Bonds 2021B	255,075,000	255,075,000
Senior Lien Refunding Bonds 2021D	274,625,000	274,625,000
Senior Lien Refunding Bonds 2021E	335,610,000	340,765,000
Sn Lien Rev Bnd Prem/Disc 2013	298,186	2,087,304
Senior Lien Premium 2016 Revenue Bonds	7,310,522	8,542,696
Sn Lien Revenue Bond Premium 2018	3,060,933	3,327,506
Senior Lien Revenue Bond Premium 2020A	11,290,604	11,432,179
Senior Lien Refunding Bond Premium 2020B	11,593,297	12,128,373
Senior Lien Revenue Bonds Premium 2020E	25,284,127	26,999,513
Senior Lien Revenue Bonds Premium 2021B	53,376,804	53,691,231
Senior Lien Refunding Bonds Premium 2021D	44,718,564	44,973,500
Total Senior Lien Revenue Bonds	1,671,369,820	1,690,852,998

Central Texas Regional Mobility Authority
Balance Sheet
as of October 31, 2022

	as of 10/31/2022	as of 10/31/2021
Sub Lien Revenue Bonds:		
Sub Lien Refunding Bonds 2013	2,725,000	5,320,000
Sub Lien Refunding Bonds 2016	72,605,000	73,055,000
Sub Lien Refunding Bonds 2020D	98,580,000	99,705,000
Subordinated Lien BANS 2020F	110,875,000	110,875,000
Subordinate Lien Refunding Bonds 2020G	61,570,000	61,570,000
Subordinated Lien BANS 2021C	244,185,000	244,185,000
Sub Refunding 2013 Prem/Disc	63,625	445,372
Sub Refunding 2016 Prem/Disc	5,519,328	6,338,566
Subordinated Lien BANS 2020F Premium	8,672,873	12,675,738
Subordinated Lien Refunding Bonds Premium 2020G	7,033,562	7,437,534
Sub Lien BANS 2021C Premium	31,715,322	39,327,000
Total Sub Lien Revenue Bonds	643,544,711	660,934,210
Other Obligations		
TIFIA Note 2021	353,890,618	346,332,777
71E TxDOT Obligation - LT	55,077,264	57,263,411
Regions 2017 MoPAC Note	-	24,990,900
Regions 2022 MoPac Loan	24,690,900	-
Total Other Obligations	433,658,783	428,587,087
Total Long Term Liabilities	2,750,295,629	2,780,768,648
Total Liabilities	2,838,090,061	2,864,641,431
NET ASSETS		
Contributed Capital	121,462,104	121,462,104
Net Assets Beginning	494,532,189	515,659,579
Current Year Operations	9,313,768	(11,511,568)
Total Net Assets	625,308,061	625,610,115
Total Liabilities and Net Assets	\$ 3,463,398,122	\$ 3,490,251,547

Central Texas Regional Mobility Authority
Statement of Cash Flow
as of October 2022

Cash flows from operating activities:

Receipts from toll revenues	\$ 71,060,099
Payments to vendors	(16,064,817)
Payments to employees	(1,581,734)
Net cash flows provided by (used in) operating activities	53,413,549

Cash flows from capital and related financing activities:

Issuance Expense	(176,099)
Payments on bonds / loans	(300,000)
Interest payments	(39,904,215)
RIF Contribution	(5,000,000)
Acquisition of capital assets - non project	(1,422,647)
Acquisitions of construction in progress	(30,305,570)
Net cash flows provided by (used in) capital and related financing activities	(77,108,531)

Cash flows from investing activities:

Interest Receivable	2,018
Interest income	5,795,311
Purchase of investments	(28,126,087)
Proceeds from sale or maturity of investments	137,044,443
Net cash flows provided by (used in) investing activities	114,713,667
Net increase (decrease) in cash and cash equivalents	91,018,685
Cash and cash equivalents at beginning of period	1,029,061,201
Cash and cash equivalents at end of period	\$ 1,120,079,886

Reconciliation of change in net assets to net cash provided by operating activities:

Operating income	\$ 29,749,420
Adjustments to reconcile change in net assets to net cash provided by operating activities:	
Depreciation and amortization	21,171,190
Changes in assets and liabilities:	
(Increase) decrease in accounts receivable	3,436,568
(Increase) decrease in prepaid expenses and other assets	(411,276)
(Decrease) increase in accounts payable	(908,109)
Increase (decrease) in accrued expenses	375,755
Total adjustments	23,664,129
Net cash flows provided by (used in) operating activities	\$ 53,413,549

Reconciliation of cash and cash equivalents:

Unrestricted cash and cash equivalents	\$ 182,880,497
Restricted cash and cash equivalents	937,199,389
Total	\$ 1,120,079,886

INVESTMENTS by FUND

		Balance October 31, 2022	
Renewal & Replacement Fund			TexSTAR 11,480,038.62
TexSTAR	1,810.21		Goldman Sachs 1,100,941,775.79
Goldman Sachs	87,088.96		Agencies & Treasury Notes -
Agencies/ Treasuries		88,899.17	
Grant Fund			\$ 1,112,421,814.41
TexSTAR	458,672.95		
Goldman Sachs	9,681,294.68		
Agencies/ Treasuries		10,139,967.63	
Senior Debt Service Reserve Fund			
TexSTAR	995,463.28		
Goldman Sachs	107,631,645.77		
Agencies/ Treasuries		108,627,109.05	
2010 Senior Lien Debt Service Account			
Goldman Sachs	61,068.35	61,068.35	
2011 Sr Debt Service Accountt			
Goldman Sachs	3,121,557.40	3,121,557.40	
2013 Sr Debt Service Accountt			
Goldman Sachs	2,966,376.23	2,966,376.23	
2013 Sub Debt Service Account			
Goldman Sachs	2,326,228.73	2,326,228.73	
2013 Sub Debt Service Reserve Fund			
Goldman Sachs	124.12	787,846.64	
TexSTAR	787,722.52		
2015 Sr Debt Service Account			
Goldman Sachs	4,512,043.65	4,512,043.65	
2016 Sr Lien Rev Refunding Debt Service Account			
Goldman Sachs	11,688,294.66	11,688,294.66	
2016 Sub Lien Rev Refunding Debt Service Account			
Goldman Sachs	2,079,308.43	2,079,308.43	
2016 Sub Lien Rev Refunding DSR			
Goldman Sachs	7,044,979.32	7,044,979.32	
Agencies/ Treasuries		-	
Operating Fund			
TexSTAR	43,034.16		
TexSTAR-Trustee	6,049,999.19		
Goldman Sachs	7,927,521.59	14,020,554.94	
Revenue Fund			
Goldman Sachs	8,548,614.10	8,548,614.10	
General Fund			
TexSTAR	1,148,704.72		
Goldman Sachs	129,017,742.37		
Agencies/ Treasuries		130,166,447.09	
71E Revenue Fund			
Goldman Sachs	25,089,871.34	25,089,871.34	
MoPac Revenue Fund			
Goldman Sachs	109,545.63	109,545.63	
MoPac General Fund			
Goldman Sachs	8,585,875.83	8,585,875.83	
MoPac Operating Fund			
Goldman Sachs	465,000.83	465,000.83	
MoPac Loan Repayment Fund			
Goldman Sachs	578,445.66	578,445.66	
2015B Project Account			
Goldman Sachs	42,269,568.14		
TexSTAR	353,058.62	42,622,626.76	
2015 TIFIA Project Account			
Goldman Sachs	37,957,739.99		
TexSTAR	701,406.63		
Agencies/ Treasuries		38,659,146.62	
2011 Sr Financial Assistance Fund			
Goldman Sachs	979,966.49	979,982.50	
TexSTAR	16.01		
2018 Sr Lien Debt Service Account			
Goldman Sachs	606,978.22	606,978.22	
2018 Sr Lien Project Cap I			
Goldman Sachs	201,156.84	201,156.84	
2018 Sr Lien Project Account			
Goldman Sachs	11,018,519.24		
TexSTAR	940,150.33	11,958,669.57	
2020A Senior Lien Debt Service Account			
Goldman Sachs	1,063,239.16	1,063,239.16	
2020B Senior Lien Debt Service Account			
Goldman Sachs	1,427,176.16	1,427,176.16	
2020C Senior Lien Debt Service Account			
Goldman Sachs	1,263,450.50	1,263,450.50	
2020D Sub Lien Debt Service Account			
Goldman Sachs	1,946,399.50	1,946,399.50	
2020D Sub Debt Service Reserve Fund			
Goldman Sachs	8,177,693.33	8,177,693.33	
2020E Senior Lien Project Account			
Goldman Sachs	152,570,459.17	152,570,459.17	
2020E Senior Lien Project Cap Interest			
Goldman Sachs	21,858,046.10	21,858,046.10	
2020F Sub Lien Project Account			
Goldman Sachs	21,417,259.06	21,417,259.06	
2020F Sub Lien Deb Service Account			
Goldman Sachs	1,853,384.46	1,853,384.46	
2020G Sub Lien Debt Service Account			
Goldman Sachs	853,384.28	853,384.28	
2020G Sub Lien Debt Service Reserve Account			
Goldman Sachs	2,857,162.81	2,857,162.81	
2021A Sub Lien Debt Service Reserve Account			
Goldman Sachs	12,190,487.48	12,190,487.48	31,058,169.58
2021A Sub Debt Service Account			
Goldman Sachs	96.41	96.41	
2021B Senior Lien Cap I Project Fund			
Goldman Sachs	46,295,775.24	46,295,775.24	
2021B Senior Lien Project Account			
Goldman Sachs	231,366,594.02		
Agencies/ Treasuries		231,366,594.02	
2021C Sub Lien Cap I Project Fund			
Goldman Sachs	1,345.60	1,345.60	
2021C Sub Lien Project Account			
Goldman Sachs	157,224,254.48	157,224,254.48	
2021C Sub Lien Debt Service Account			
Goldman Sachs	4,081,069.53	4,081,069.53	
2021D Senior Lien Debt Service Account			
Goldman Sachs	4,147,596.25	4,147,596.25	
2021E Senior Lien Debt Service Account			
Goldman Sachs	5,790,345.68	5,790,345.68	
		\$ 1,112,421,814.41	

CTRMA INVESTMENT REPORT

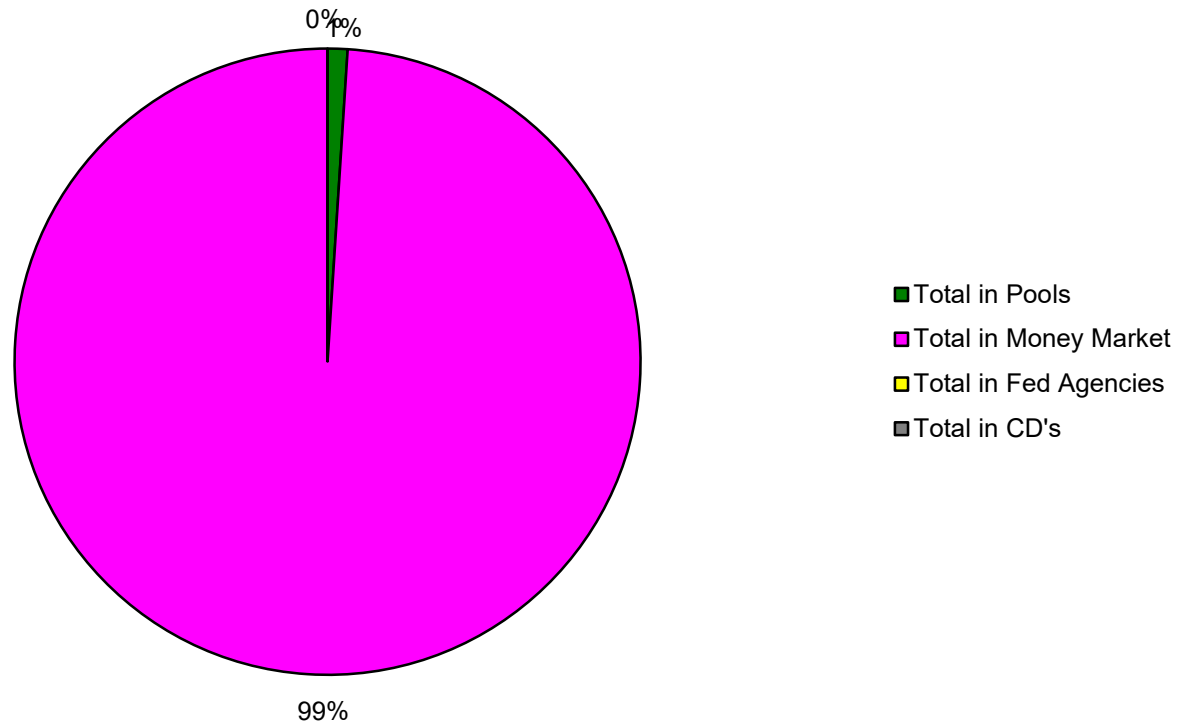
	Month Ending 10/31/2022					Rate September	
	Balance 10/1/2022	Additions	Discount Amortization	Accrued Interest	Withdrawals		Balance 10/31/2022
Amount in Trustee TexStar							
2011 Sr Lien Financial Assist Fund	16.01					16.01	2.2941%
2013 Sub Lien Debt Service Reserve General Fund	785,818.55 1,145,928.21			1,903.97 2,776.51		787,722.52 1,148,704.72	2.2941% 2.2941%
Trustee Operating Fund	5,035,907.38	4,000,000.00		14,091.81	3,000,000.00	6,049,999.19	2.2941%
Renewal and Replacement Grant Fund	1,805.86 457,564.31			4.35 1,108.64		1,810.21 458,672.95	2.2941% 2.2941%
Senior Lien Debt Service Reserve Fund	993,057.18			2,406.10		995,463.28	2.2941%
2015B Sr Ln Project	352,205.25			853.37		353,058.62	2.2941%
2015C TIFIA Project	699,711.28			1,695.35		701,406.63	2.2941%
2018 Sr Lien Project Account	937,877.91			2,272.42		940,150.33	2.2941%
	10,409,891.94	4,000,000.00		27,112.52	3,000,000.00	11,437,004.46	
Amount in TexStar Operating Fund	42,930.14	3,000,000.00		104.02	3,000,000.00	43,034.16	2.2941%
Goldman Sachs							
Operating Fund	7,850,774.27	4,077,077.72		15,669.60	4,016,000.00	7,927,521.59	2.4719%
2020A Senior Lien Debt Service Account	962,574.70	98,815.62		1,848.84		1,063,239.16	2.4719%
2020B Senior Lien Debt Service Account	1,148,654.29	276,450.46		2,071.41		1,427,176.16	2.4719%
2020C Senior Lien Debt Service Account	947,317.32	314,498.42		1,634.76		1,263,450.50	2.4719%
2020D Sub Lien Debt Service Account	1,601,575.31	341,898.96		2,925.23		1,946,399.50	2.4719%
2020D Sub Debt Service Reserve Fund	8,161,305.18			16,388.15		8,177,693.33	2.4719%
2020E Sr Lien Project Account	152,264,706.91			305,752.26		152,570,459.17	2.4719%
2020E Sr Ln Project Cap Interest	21,814,242.42			43,803.68		21,858,046.10	2.4719%
2020F Sub Lien Project Account	24,870,974.64			50,354.64	3,504,070.22	21,417,259.06	2.4719%
2020F Sub Lien Debt Service Account	1,389,629.39	461,357.03		2,398.04		1,853,384.46	2.4719%
2020G Sub Lien Debt Service Account	639,849.91	212,430.20		1,104.17		853,384.28	2.4719%
2020G Sub Debt Service Reserve Fund	2,755,846.98	95,863.53		5,452.30		2,857,162.81	2.4719%
2021A Sub Debt Service Reserve Fund	11,619,833.05	547,787.33		22,867.10		12,190,487.48	2.4719%
2021A Sub Debt Service Account	96.22			0.19		96.41	2.4719%
2021B Senior Lien Cap I Project Fund	46,202,998.18			92,777.06		46,295,775.24	2.4719%
2021B Senior Lien Project Account	231,025,689.04			340,904.98		231,366,594.02	2.4719%
2021C Sub Lien Cap I Project Fund	1,342.90			2.70		1,345.60	2.4719%
2021C Sub Lien Project Account	162,630,875.32			329,470.82	5,736,091.66	157,224,254.48	2.4719%
2021C Sub Lien Debt Service Account	3,059,567.40	1,016,222.72		5,279.41		4,081,069.53	2.4719%
2021D Senior Lien Debt Service Account	3,169,032.81	973,027.48		5,535.96		4,147,596.25	2.4719%
2021E Senior Lien Debt Service Account	4,718,824.07	1,062,950.10		8,571.51		5,790,345.68	2.4719%
2011 Sr Financial Assistance Fund	978,002.53			1,963.96		979,966.49	2.4719%
2010 Senior DSF	60,945.96			122.39		61,068.35	2.4719%
2011 Senior Lien Debt Service Account	2,805,792.77	310,394.25		5,370.38		3,121,557.40	2.4719%
2013 Senior Lien Debt Service Account	2,657,603.94	303,693.80		5,078.49		2,966,376.23	2.4719%
2013 Sub Debt Service Reserve Fund	123.87			0.25		124.12	2.4719%
2013 Subordinate Debt Service Account	2,084,078.42	238,167.79		3,982.52		2,326,228.73	2.4719%
2015A Sr Lien Debt Service Account	4,503,001.01			9,042.64		4,512,043.65	2.4719%
2015B Project Account	42,184,855.21			84,712.93		42,269,568.14	2.4719%
2015C TIFIA Project Account	38,558,048.36			77,606.71	677,915.08	37,957,739.99	2.4719%
2016 Sr Lien Rev Refunding Debt Service Account	10,989,475.65	677,326.81		21,492.20		11,688,294.66	2.4719%
2016 Sub Lien Rev Refunding Debt Service Account	1,704,969.70	371,230.70		3,108.03		2,079,308.43	2.4719%
2016 Sub Lien Rev Refunding DSR	7,030,860.40			14,118.92		7,044,979.32	2.4719%
2018 Sr Lien Project Cap I	200,753.72			403.12		201,156.84	2.4719%
2018 Sr Lien Debt Service Account	454,779.02	151,414.77		784.43		606,978.22	2.4719%
2018 Sr Lien Project Account	11,008,564.70			22,112.69	12,158.15	11,018,519.24	2.4719%
Grant Fund	9,664,893.85			16,400.83		9,681,294.68	2.4719%
Renewal and Replacement	40,175.84	600,000.00		306.63	553,393.51	87,088.96	2.4719%
Revenue Fund	8,808,344.27	15,022,053.53		13,994.79	15,295,778.49	8,548,614.10	2.4719%
General Fund	127,144,500.92	2,254,801.02		251,510.29	633,069.86	129,017,742.37	2.4719%
Senior Lien Debt Service Reserve Fund	107,428,216.31			203,429.46		107,631,645.77	2.4719%
71E Revenue Fund	24,133,657.79	1,066,783.25		47,528.64	158,098.34	25,089,871.34	2.4719%
MoPac Revenue Fund	88,572.45	1,230,395.30		1,464.38	1,210,886.50	109,545.63	2.4719%
MoPac General Fund	8,116,908.05	466,913.53		14,202.02	12,147.77	8,585,875.83	2.4719%
MoPac Operating Fund	183,208.77	650,410.62		653.57	369,272.13	465,000.83	2.4719%
MoPac Loan Repayment Fund	433,837.98	143,968.25		639.43		578,445.66	2.4719%
	1,098,099,881.80	32,965,933.19		2,054,842.51	32,178,881.71	1,100,941,775.79	
Amount in Fed Agencies and Treasuries							
Amortized Principal	0.00				0.00	0.00	
	0.00					0.00	
Certificates of Deposit							
Total in Pools	10,452,822.08	7,000,000.00		27,216.54	6,000,000.00	11,480,038.62	
Total in GS FSGF	1,098,099,878.80	32,965,933.19		2,054,842.51	32,178,881.71	1,100,941,775.79	
Total in Fed Agencies and Treasuries	0.00				0.00	0.00	
Total Invested	1,108,552,700.88	39,965,933.19		2,082,059.05	38,178,881.71	1,112,421,814.41	

All Investments in the portfolio are in compliance with the CTRMA's Investment policy and the relevant provisions of the Public Funds Investment Act Chapter 2256.023

José Hernández, CFO

10/31/2022

Allocation of Funds



ESCROW FUNDS

Travis County Escrow Fund - Elroy Road

	<u>Balance</u>		<u>Accrued</u>		<u>Balance</u>
	<u>10/1/2022</u>	<u>Additions</u>	<u>Interest</u>	<u>Withdrawals</u>	<u>10/31/2022</u>
Goldman Sachs	3,760,635.71		7,583.81	27,709.17	3,740,510.35

Travis County Escrow Fund - Ross Road

	<u>Balance</u>		<u>Accrued</u>		<u>Balance</u>
	<u>10/1/2022</u>	<u>Additions</u>	<u>Interest</u>	<u>Withdrawals</u>	<u>10/31/2022</u>
Goldman Sachs	115,660.98		234.05	1,771.72	114,123.31

Travis County Escrow Fund - Old San Antonio Road

	<u>Balance</u>		<u>Accrued</u>		<u>Balance</u>
	<u>10/1/2022</u>	<u>Additions</u>	<u>Interest</u>	<u>Withdrawals</u>	<u>10/31/2022</u>
Goldman Sachs	47,452.99		95.29	2,101.97	45,446.31

Travis County Escrow Fund - Old Lockhart Road

	<u>Balance</u>		<u>Accrued</u>		<u>Balance</u>
	<u>10/1/2022</u>	<u>Additions</u>	<u>Interest</u>	<u>Withdrawals</u>	<u>10/31/2022</u>
Goldman Sachs	263,534.79		529.19		264,063.98

Travis County Escrow Fund - County Line Road

	<u>Balance</u>		<u>Accrued</u>		<u>Balance</u>
	<u>10/1/2022</u>	<u>Additions</u>	<u>Interest</u>	<u>Withdrawals</u>	<u>10/31/2022</u>
Goldman Sachs	321,485.06		650.32	1,735.84	320,399.54

Travis County Escrow Fund - South Pleasant Valley Road

	<u>Balance</u>		<u>Accrued</u>		<u>Balance</u>
	<u>10/1/2022</u>	<u>Additions</u>	<u>Interest</u>	<u>Withdrawals</u>	<u>10/31/2022</u>
Goldman Sachs	323,961.84		664.11	2,828.15	321,797.80

Travis County Escrow Fund - Thaxton Road

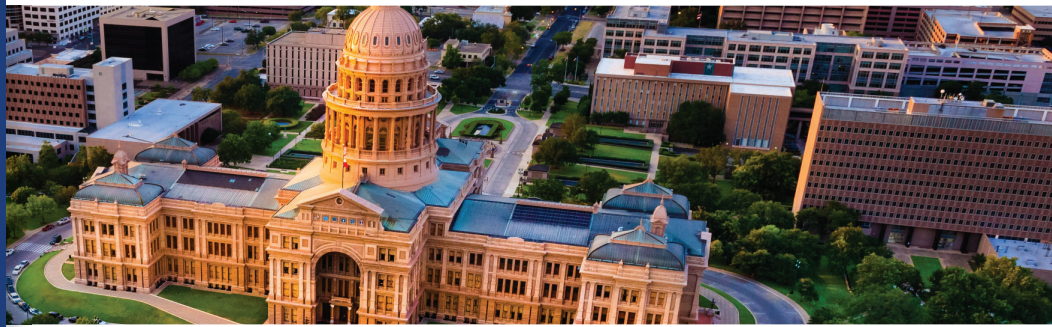
	<u>Balance</u>		<u>Accrued</u>		<u>Balance</u>
	<u>10/1/2022</u>	<u>Additions</u>	<u>Interest</u>	<u>Withdrawals</u>	<u>10/31/2022</u>
Goldman Sachs	138,549.44		281.51	2,137.95	136,693.00

Travis County Escrow Fund - Pearce Lane Road

	<u>Balance</u>		<u>Accrued</u>		<u>Balance</u>
	<u>10/1/2022</u>	<u>Additions</u>	<u>Interest</u>	<u>Withdrawals</u>	<u>10/31/2022</u>
Goldman Sachs	312,608.86		635.05	2,483.06	310,760.85



**MONTHLY
NEWSLETTER
OCTOBER
2022**



PERFORMANCE

As of October 31, 2022

Current Invested Balance	\$8,388,414,626.87
Weighted Average Maturity (1)	8 Days
Weighted Average Life (2)	45 Days
Net Asset Value	0.999581
Total Number of Participants	996
Management Fee on Invested Balance	0.06%*
Interest Distributed	\$20,641,718.26
Management Fee Collected	\$425,189.91
% of Portfolio Invested Beyond 1 Year	4.59%
Standard & Poor's Current Rating	AAAm

Rates reflect historical information and are not an indication of future performance.

October Averages

Average Invested Balance	\$8,343,961,244.96
Average Monthly Yield, on a simple basis	2.8531%
Average Weighted Maturity (1)	10 Days
Average Weighted Life (2)	46 Days

Definition of Weighted Average Maturity (1) & (2)

(1) This weighted average maturity calculation uses the SEC Rule 2a-7 definition for stated maturity for any floating rate instrument held in the portfolio to determine the weighted average maturity for the pool. This Rule specifies that a variable rate instruction to be paid in 397 calendar days or less shall be deemed to have a maturity equal to the period remaining until the next readjustment of the interest rate.
 (2) This weighted average maturity calculation uses the final maturity of any floating rate instruments held in the portfolio to calculate the weighted average maturity for the pool.

The maximum management fee authorized for the TexSTAR Cash Reserve Fund is 12 basis points. This fee may be waived in full or in part in the discretion of the TexSTAR co-administrators at any time as provided for in the TexSTAR Information Statement.

NEW PARTICIPANTS

We would like to welcome the following entities who joined the TexSTAR program in October:

* Apple Springs Independent School District * Mountain Peak Special Utility District

HOLIDAY REMINDER

In observance of the **Veterans Day holiday, TexSTAR will be closed on Friday, November 11, 2022.** All ACH transactions initiated on Thursday, November 10th will settle on Monday, November 14th. Please plan accordingly for your liquidity needs.

In observance of the **Thanksgiving Day holiday, TexSTAR will be closed Thursday, November 24, 2022.** All ACH transactions initiated on Wednesday, November 23rd will settle Friday, November 25th. Notification of any early transaction deadlines on the day preceding or following this holiday will be sent out by email to the primary contact on file for all TexSTAR participants.

ECONOMIC COMMENTARY

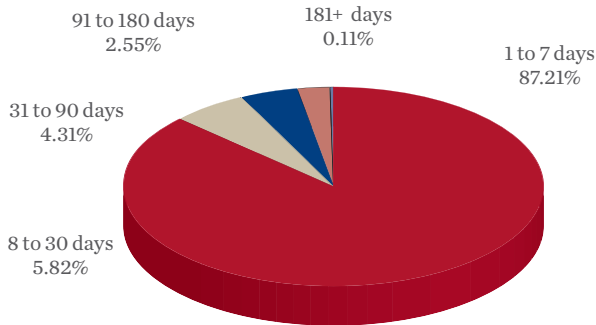
Market review

Early in the month, hopes for a potential Fed policy pivot were once again dashed by a strong U.S. labor market data. Treasury yields continued to rise and credit spreads widened amid robust job gains, a hawkish Fed, and another inflation surprise. The growth picture remained mixed with momentum declining amid persistent price pressures, as rates turned restrictive and broader financial conditions have tightened considerably. Following two quarters of negative GDP growth, 3Q22 real GDP expanded at a 2.6% annualized rate, slightly stronger than the 2.4% consensus expectation. However, the details of the report suggested that economic growth momentum is waning. Much of the gain came from a large upswing in trade, as the U.S. exported more oil and natural gas with the war in Ukraine disrupting supplies in Europe. Real consumer spending continued to soften, rising by a modest 1.4%, and construction spending was very weak with the climb in interest rates. However, investment spending is still holding up, and the GDP price deflator declined markedly to 4.1% from 9% last quarter. Moreover, with pent-up demand for autos and a still very tight labor market, it is clear the economy is not yet in recession.

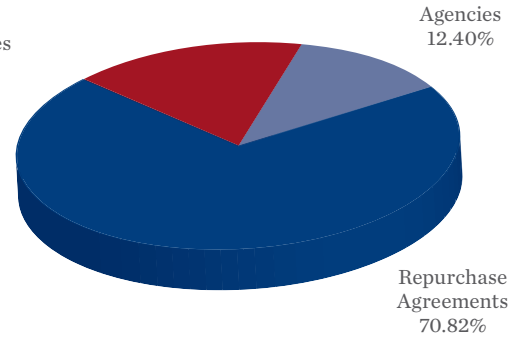
The September jobs report underscored the resilience of labor market, with the recent pace of job growth still solid at 263,000 but moderating, and wage growth continuing to run at a more modest pace of 0.3% month-over-month (m/m). (continued page 4)

INFORMATION AT A GLANCE

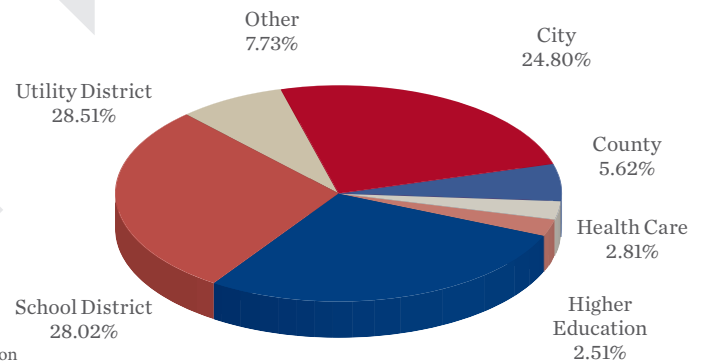
PORTFOLIO BY TYPE OF INVESTMENT AS OF OCTOBER 31, 2022



Treasuries
16.78%



PORTFOLIO BY MATURITY AS OF OCTOBER 31, 2022 (1)



DISTRIBUTION OF PARTICIPANTS BY TYPE AS OF OCTOBER 31, 2022

(1) Portfolio by Maturity is calculated using WAM (1) definition for stated maturity. See page 1 for definition

HISTORICAL PROGRAM INFORMATION

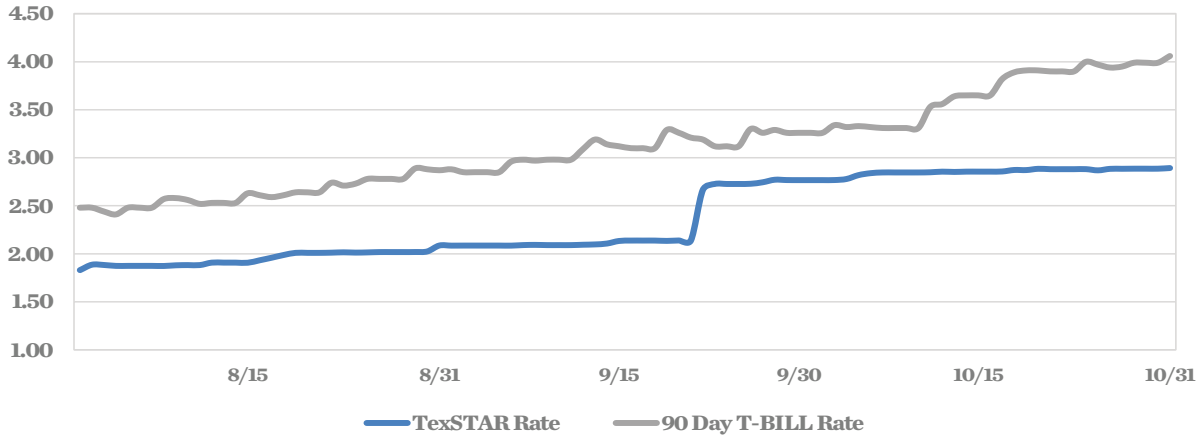
MONTH	AVERAGE RATE	BOOK VALUE	MARKET VALUE	NET ASSET VALUE	WAM (1)	WAL (2)	NUMBER OF PARTICIPANTS
Oct 22	2.8531%	\$8,388,414,626.87	\$8,384,901,873.82	0.999581	10	46	996
Sep 22	2.2941%	8,448,258,598.47	8,444,307,157.72	0.999510	16	43	994
Aug 22	1.9469%	8,988,292,520.61	8,983,610,837.50	0.999479	27	50	991
Jul 22	1.4010%	9,799,798,062.32	9,793,880,215.07	0.999396	34	49	990
Jun 22	0.9850%	9,799,299,684.61	9,793,062,348.93	0.999363	42	57	989
May 22	0.6459%	9,701,777,049.61	9,700,243,468.41	0.999841	43	61	988
Apr 22	0.3225%	8,985,925,505.16	8,984,338,322.90	0.999818	39	60	986
Mar 22	0.1070%	9,050,970,696.95	9,050,137,013.72	0.999907	27	38	981
Feb 22	0.0104%	9,779,113,455.23	9,778,353,196.78	0.999922	26	32	979
Jan 22	0.0100%	9,399,813,099.48	9,399,092,954.95	0.999923	31	38	977
Dec 21	0.0139%	8,763,539,414.27	8,763,577,847.71	1.000011	40	52	977
Nov 21	0.0102%	8,132,746,877.26	8,133,007,416.80	1.000032	47	62	965

PORTFOLIO ASSET SUMMARY AS OF OCTOBER 31, 2022

	BOOK VALUE	MARKET VALUE
Uninvested Balance	\$ 619.95	\$ 619.95
Accrual of Interest Income	2,631,607.53	2,631,607.53
Interest and Management Fees Payable	(20,584,934.57)	(20,584,934.57)
Payable for Investment Purchased	(200,000,000.00)	(200,000,000.00)
Repurchase Agreement	6,094,539,999.57	6,094,539,999.57
Government Securities	2,511,827,334.39	2,508,314,581.34
TOTAL	\$ 8,388,414,626.87	\$ 8,384,901,873.82

Market value of collateral supporting the Repurchase Agreements is at least 102% of the Book Value. The portfolio is managed by J.P. Morgan Chase & Co. and the assets are safekept in a separate custodial account at the Federal Reserve Bank in the name of TexSTAR. The only source of payment to the Participants are the assets of TexSTAR. There is no secondary source of payment for the pool such as insurance or guarantee. Should you require a copy of the portfolio, please contact TexSTAR Participant Services.

TEXSTAR VERSUS 90-DAY TREASURY BILL



This material is for information purposes only. This information does not represent an offer to buy or sell a security. The above rate information is obtained from sources that are believed to be reliable; however, its accuracy or completeness may be subject to change. The TexSTAR management fee may be waived in full or in part at the discretion of the TexSTAR co-administrators and the TexSTAR rate for the period shown reflects waiver of fees. This table represents historical investment performance/return to the customer, net of fees, and is not an indication of future performance. An investment in the security is not insured or guaranteed by the Federal Deposit Insurance Corporation or any other government agency. Although the issuer seeks to preserve the value of an investment of \$1.00 per share, it is possible to lose money by investing in the security. Information about these and other program details are in the fund's Information Statement which should be read carefully before investing. The yield on the 90-Day Treasury Bill ("T-Bill Yield") is shown for comparative purposes only. When comparing the investment returns of the TexSTAR pool to the T-Bill Yield, you should know that the TexSTAR pool consists of allocations of specific diversified securities as detailed in the respective Information Statements. The T-Bill Yield is taken from Bloomberg Finance L.P. and represents the daily closing yield on the then current 90-Day T-Bill. The TexSTAR yield is calculated in accordance with regulations governing the registration of open-end management investment companies under the Investment Company Act of 1940 as promulgated from time to time by the federal Securities and Exchange Commission.

DAILY SUMMARY FOR OCTOBER 2022

DATE	MNY MKT FUND EQUIV. [SEC Std.]	DAILY ALLOCATION FACTOR	INVESTED BALANCE	MARKET VALUE PER SHARE	WAM DAYS (1)	WAL DAYS (2)
10/1/2022	2.7669%	0.000075805	\$8,448,258,598.47	0.999510	12	48
10/2/2022	2.7669%	0.000075805	\$8,448,258,598.47	0.999510	12	48
10/3/2022	2.7677%	0.000075828	\$8,546,403,441.61	0.999545	12	47
10/4/2022	2.7786%	0.000076126	\$8,555,635,793.14	0.999517	12	47
10/5/2022	2.8190%	0.000077233	\$8,619,529,697.47	0.999525	12	46
10/6/2022	2.8392%	0.000077785	\$8,532,349,041.63	0.999522	12	47
10/7/2022	2.8468%	0.000077994	\$8,393,770,136.93	0.999520	11	46
10/8/2022	2.8468%	0.000077994	\$8,393,770,136.93	0.999520	11	46
10/9/2022	2.8468%	0.000077994	\$8,393,770,136.93	0.999520	11	46
10/10/2022	2.8468%	0.000077994	\$8,393,770,136.93	0.999520	11	46
10/11/2022	2.8487%	0.000078046	\$8,375,762,554.14	0.999533	11	46
10/12/2022	2.8552%	0.000078224	\$8,244,434,045.37	0.999529	11	47
10/13/2022	2.8522%	0.000078143	\$8,232,757,434.55	0.999510	11	46
10/14/2022	2.8554%	0.000078229	\$8,355,977,339.03	0.999511	10	45
10/15/2022	2.8554%	0.000078229	\$8,355,977,339.03	0.999511	10	45
10/16/2022	2.8554%	0.000078229	\$8,355,977,339.03	0.999511	10	45
10/17/2022	2.8570%	0.000078274	\$8,370,339,385.12	0.999508	10	45
10/18/2022	2.8726%	0.000078701	\$8,351,362,738.61	0.999523	10	44
10/19/2022	2.8716%	0.000078673	\$8,299,427,423.22	0.999519	10	44
10/20/2022	2.8848%	0.000079035	\$8,223,564,756.32	0.999537	10	45
10/21/2022	2.8810%	0.000078932	\$8,167,276,500.23	0.999557	9	44
10/22/2022	2.8810%	0.000078932	\$8,167,276,500.23	0.999557	9	44
10/23/2022	2.8810%	0.000078932	\$8,167,276,500.23	0.999557	9	44
10/24/2022	2.8814%	0.000078943	\$8,163,585,102.78	0.999553	9	44
10/25/2022	2.8688%	0.000078597	\$8,248,975,403.49	0.999565	9	45
10/26/2022	2.8844%	0.000079025	\$8,288,069,102.49	0.999575	9	45
10/27/2022	2.8850%	0.000079041	\$8,306,842,949.95	0.999582	8	46
10/28/2022	2.8861%	0.000079072	\$8,291,328,611.51	0.999596	8	46
10/29/2022	2.8861%	0.000079072	\$8,291,328,611.51	0.999596	8	46
10/30/2022	2.8861%	0.000079072	\$8,291,328,611.51	0.999596	8	46
10/31/2022	2.8927%	0.000079251	\$8,388,414,626.87	0.999581	8	45
Average	2.8531%	0.000078168	\$8,343,961,244.96		10	46



ECONOMIC COMMENTARY (cont.)

Private sector job gains were broad-based with the greatest strength in leisure and hospitality and health care. The unemployment rate fell back down to 3.5%. After having fallen in the past few months, the number of job openings rose 4.3% to 10.717 million in September as indicated by the JOLTS report. The number of job openings are still below their all-time high reported in March but have remained above pre-pandemic standards. Layoffs remained low, with a 10.9% drop to 1.328 million reported for September. Overall, the high level of job openings suggests sustained tightness in the labor market.

Hot inflation is beginning to cool down but continued to surprise to the upside. The headline PCE price index rose 0.3% m/m and 6.3% year-over-year (y/y) in September. The core PCE deflator also rose 0.5% m/m and 5.1% y/y. After a string of upside surprises, the September CPI report came in hotter than expected. Headline CPI rose 0.4% m/m and 8.2% y/y easing slightly from 8.3% in August. Strong services inflation offset declines in core goods and energy prices, with Core CPI inflation jumping 0.6% m/m and 6.6% y/y. Wage inflation and resilient demand have contributed to strong services inflation, while the lagged effect of rising rents continues to propel owners' equivalent rent higher. Softer commodity prices, lower shipping costs and improved supply chains should continue to reduce inflation pressure across a range of goods over the coming months. Importantly, the inventory crunch experienced last year has also reversed. Stockpiling in the first half of the year has allowed retail inventories to recover beyond pre-pandemic levels, while retail sales have flat lined. Even though energy prices have declined, other areas of inflation, such as food prices, services inflation, and owners' equivalent rent, still remain hot.

That said, higher rates weighed on housing demand and prices as mortgage rates exceeded 7% for the first time in 20 years. Real residential investment tumbled 26% in 3Q on top of the 18% 2Q drop and displayed signs of additional weakness ahead. Pending home sales, a leading indicator of existing home sales, continued to push sharply lower into September, with a 10% drop reported for the month. While the Fed didn't have a meeting in October, Fed speakers continued their hawkish rhetoric. Given the persistently high inflation and robust employment backdrop, the Federal Open Market Committee (FOMC) raised the target range for the federal funds rate by 75 basis points (bps) to 3.75-4.0% as expected at its FOMC meeting on November 2nd. The Committee noted that it will pursue monetary policy that is "sufficiently restrictive" to return inflation to 2%. The post-meeting statement also suggested a slowing in the pace of future rate hikes: "In determining the pace of future increases in the target range, the Committee will take into account the cumulative tightening of monetary policy, the lags with which monetary policy affects economic activity and inflation, and economic and financial developments." However, during the press conference that followed, Chair Powell emphasized that "the ultimate level of interest rates will be higher than previously expected," and that it is "very premature to think about pausing." Rate volatility continued as financial conditions tightened during the month. In this environment, the U.S. Treasury yield curve remained inverted between two-year and 10-year yields as front-end U.S. Treasury yields climbed higher. The curve between the three-month Treasury bill and 10-year note yields inverted for the first time this year ending the month at -2 bps. In the money market space, the three-month Treasury bill yield rose 80 bps on the month to end at 4.07%, while the six-month and 12-month Treasury bill yields increased 61 bps and 65 bps to end at 4.54% and 4.64%, respectively.

Outlook

The impact of fast and aggressive Fed interest rate hikes is starting to become evident in economic data. After two months of consecutive increases, the U.S. Conference Board's Consumer Confidence Index fell to 102.5 in October versus expectations of 105.9, reflecting consumers' concerns about sticky inflation and a possible recession next year. The survey also showed signs of a cooling labor market, with a decline in the number of consumers viewing jobs as "plentiful" and an increase in those viewing jobs "hard to get". Separately, October saw the fourth consecutive month of contraction in U.S. business activity, with the U.S. Composite Purchasing Managers' Index print of 46.6 falling short of the 49.2 consensus forecast. Although the Fed has been vocal on its plan to slow growth to bring down inflation, the lagged economic effects of rate hikes have not gone unnoticed. In fact, at the recent November FOMC meeting, the Fed noted that it will consider lags in determining the pace of future rate hikes. Chair Powell emphasized that the Fed is far from pausing even if smaller increases could become appropriate and that the September FOMC projections on the terminal rate were likely to be revised higher. Inflation continues to be a key concern.



ECONOMIC COMMENTARY (cont.)

There are a variety of signals that point to continued labor market strength into year end, including low levels of jobless claims filings and favorable consumer responses about the availability of employment. Inflation has significantly and repeatedly surprised to the upside over the past year, pushing the Fed to tighten policy aggressively. While inflation is likely to remain above-target through the end of next year, we see signs that a moderation is already underway and that this cooling will become more prominent over time. Two main forces are driving this expected moderation. First, pandemic-related distortions that added inflationary pressures are finally starting to abate. Supply chain dislocations have eased and a surge in pent-up demand (initially for goods and more recently for services, such as travel) should fade. Second, the Fed's policy moves have led to tighter financial conditions, including significant U.S. dollar appreciation and higher mortgage rates. As the Fed continues to push policy further into restrictive territory into early next year, we expect the now-tight labor market to loosen as well. Labor market conditions will be an important driver of inflation both in the near-term and further into the future. The Fed is beginning to see signs that its aggressive hiking policy is feeding into economic data. Although a slowdown in the magnitude of rate hikes is likely, it will depend on future inflation releases. We view the current market pricing for the terminal rate, at 5%-5.25% as reasonable, although surprises in inflation could cause further volatility in the near term.

This information is an excerpt from an economic report dated October 2022 provided to TexSTAR by JP Morgan Asset Management, Inc., the investment manager of the TexSTAR pool.

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David Pate	Richardson ISD	Governing Board Vice President
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CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

December 14, 2022 AGENDA ITEM #9

Discuss and consider awarding and approving the award and execution of contracts for construction engineering & inspection (CE&I) services with BGE, Inc. and IEA Inc. for the CE&I Services Pool

Strategic Plan Relevance:	Collaboration, Safety, Stewardship
Department:	Engineering
Contact:	Mike Sexton, P.E., Acting Director of Engineering
Associated Costs:	Not to exceed \$3,000,000 per contract
Funding Source:	Project Funds
Action Requested:	Consider and act on draft resolution

Project Description/Background: The Mobility Authority requires CE&I services for the construction of components such as earthwork, roadway, structures, and traffic control activities for various projects including the Barton Skyway Ramp Relief project and Travis County Program projects. In addition to the base scope of services, materials testing, and survey quality assurance will be included.

The Barton Skyway Ramp Relief Project proposes non-tolled improvements on State Loop 1 (MoPac) between Barton Skyway and State Loop 360. Improvements include pavement widening for auxiliary and merge lanes on southbound MoPac at the Bee Caves Road and Barton Skyway entrance ramps, and a reconfiguration of the southbound lane assignments at the State Loop 360 southbound exit.

The Travis County Program projects consist of projects for which Travis County has enlisted the services of the Mobility Authority to manage and deliver. These project types include roadway reconstruction and widening, bridge and drainage improvements, and pedestrian and bicycle elements.

In addition to the Barton Skyway Ramp Relief Project and the Travis County Program projects CE&I services may be required for future capital, maintenance, and renewal &

replacement projects.

Previous Actions & Brief History of the Program/Project: The procurement milestones are detailed below:

- Issuance of Request for Qualifications (RFQ) – September 8, 2022
- Deadline for submitting Statements of Qualifications (SOQ) – October 4, 2022
- CTRMA SOQ Evaluation / Scoring Meeting: October 24, 2022

On October 4, 2022 a total of 12 SOQs were received from the following firms:

- AECOM Technical Services, Inc.
- B2Z Engineering, LLC
- BGE, Inc.
- Burgess & Niple, Inc.
- H.W. Lochner, Inc.
- IEA Inc.
- Johnson, Mirmiran & Thompson, Inc.
- Pape-Dawson Engineers, Inc.
- Raba Kistner Infrastructure
- Rummel, Klepper, & Kahl, LLP
- SAM-Construction Services, LLC
- Volkert, Inc.

Based upon the review of the three-person evaluation committee, the two highest-scoring firms were selected for award and contract negotiation.

Financing: Project Funds

Action requested/Staff Recommendation: Staff recommends the Board award and approve contracts with BGE, Inc. and IEA Inc. for the CE&I Services Pool and authorizes the Executive Director to negotiate and execute the contracts in substantially the same form as attached with the scope as described, and a not to exceed budget of \$3,000,000 per contract, for a term of three years from contract execution.

Backup provided: Draft Resolution
Draft Contracts

**GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY**

RESOLUTION NO. 22-0XX

**AWARDING CONTRACTS TO BGE, INC. AND IEA, INC. FOR THE CONSTRUCTION
ENGINEERING AND INSPECTION SERVICES POOL**

WHEREAS, to ensure the ready availability of construction engineering and inspection (CE&I) services, the Central Texas Regional Mobility Authority (Mobility Authority) has established a CE&I Services Pool; and

WHEREAS, in order to obtain firms for the CE&I Services Pool, the Executive Director issued a Request for Qualifications (RFQ) on September 8, 2022, seeking firms interested in providing CE&I services to the Mobility Authority; and

WHEREAS, the Mobility Authority received responses to the RFQ from twelve firms by the October 4, 2022 deadline; and

WHEREAS, the responses were reviewed by an evaluation committee who determined BGE, Inc. and IEA, Inc. are the most highly qualified firms based on the evaluation and selection criteria set forth in the RFQ; and

WHEREAS, after reviewing the evaluation committee's findings, the Executive Director negotiated contracts for CE&I services with BGE, Inc. and IEA, Inc. which are attached hereto as Exhibit A and Exhibit B, respectively; and

WHEREAS, the Executive Director recommends that the Board approve the proposed contracts with BGE, Inc. and IEA, Inc., each in an amount not to exceed \$3,000,000, and in the form or substantially the same form attached hereto as Exhibit A and Exhibit B.

NOW THEREFORE, BE IT RESOLVED that the Board of Directors hereby approves the selection of BGE, Inc. and IEA, Inc to provide construction engineering and inspection services to the Mobility Authority as part of the CE&I Services Pool; and

BE IT FURTHER RESOLVED that the Board approves the proposed contracts with BGE, Inc. and IEA, Inc, each in an amount not to exceed \$3,000,000, and authorizes the Executive Director to finalize and execute the contracts on behalf of the Mobility Authority and in the form or substantially the same form as attached hereto as Exhibit A and Exhibit B.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 14th day of December 2022.

Submitted and reviewed by:

Approved:

James M. Bass
Executive Director

Robert W. Jenkins, Jr.
Chairman, Board of Directors

Exhibit A

BGE, Inc.

**CONTRACT FOR PROFESSIONAL SERVICES
Specific Deliverable with Work Authorizations**

THIS CONTRACT FOR ENGINEERING SERVICES is made by and between the Central Texas Regional Mobility Authority, 3300 N Interstate 35 Frontage Rd #300, Austin, Texas 78705, hereinafter called "Mobility Authority," and **BGE, Inc.**, having its principal business address at **10777 Westheimer, Suite 400 Houston TX 77042**, hereinafter called "Engineer," for the purpose of contracting for engineering services.

WITNESSETH

WHEREAS, the Mobility Authority desires to contract for services generally described as professional engineering services, and more specifically described in Article 1; and

WHEREAS, pursuant to a qualifications-based selection conducted in accordance with the Professional Services Procurement Act (Tex. Gov't Code Sec. 2254.001, et. seq.), and the Mobility Authority's Policy Code regarding the procurement of professional services, the Mobility Authority has selected the Engineer to provide the needed Services; and

WHEREAS, the Engineer has agreed to provide the Services subject to the terms and conditions hereinafter set forth.

NOW, THEREFORE, the Mobility Authority and the Engineer, in consideration of the mutual covenants and agreements herein contained, do hereby mutually agree as follows.

AGREEMENT

ARTICLE 1. SCOPE OF SERVICES. The Mobility Authority and the Engineer will furnish items and perform those services for fulfillment of this Contract as identified in Attachment B, Services to be Provided by the Mobility Authority and Attachment C, Services to be Provided by the Engineer. All services provided by the Engineer will conform to standard engineering practices and applicable rules and regulations of the Texas Engineering Practices Act and the rules of the Texas Board of Professional Engineers and Land Surveyors. This Contract does not obligate the Mobility Authority to proceed with the Services or authorize the performance of work through a Work Authorization.

ARTICLE 2. CONTRACT PERIOD. This Contract becomes effective when fully executed by all parties hereto and it shall terminate at the close of business on **December 1, 2025** (the "Contract Period") unless the Contract Period is: (1) modified by written supplemental agreement prior to the date of termination as set forth in Attachment A, General Provisions, Article 6, Supplemental Agreements; (2) extended due to a work suspension as provided for in Attachment A, Article 3, Paragraph C; or (3) otherwise terminated in accordance with Attachment A, General Provisions, Article 15, Termination. A Work Authorization issued prior to expiration of this Contract may remain in effect until such time as the Services authorized under that Work Authorization are complete and accepted by the Mobility Authority. The terms of this Contract shall continue in effect in respect to any work authorization remaining in effect following the expiration of this Contract. No new Services may be added to a Work Authorization, and no new Work Authorization may be issued after the termination date of this Contract.

ARTICLE 3. COMPENSATION.

A. Maximum Amount Payable. The maximum amount payable under this Contract without modification is shown in Attachment E, Fee Schedule.

B. Basis of Payment. The basis of payment is identified in Attachment E, Fee Schedule. Reimbursement of costs incurred under a work authorization shall be in accordance with Attachment E, Fee Schedule. The amount presented in Attachment E is the amount the Mobility Authority will agree to pay, and the Engineer will agree to accept as full and sufficient compensation and reimbursement, for the performance of all services as set forth in this Contract and work authorizations.

C. Reimbursement of Eligible Costs. To be eligible for reimbursement, the Engineer's costs must (1) be incurred in accordance with the terms of a valid work authorization; (2) be in accordance with Attachment E, Fee Schedule; and (3) comply with cost principles set forth at 48 CFR Part 31, Federal Acquisition Regulation (FAR 31). Satisfactory progress of work shall be maintained as a condition of payment.

D. Engineer Payment of Subconsultants. No later than ten (10) days after receiving payment from the Mobility Authority, the Engineer shall pay all subconsultants for work performed under a subcontract authorized hereunder. The Mobility Authority may withhold all payments that have or may become due if the Engineer fails to comply with the ten-day payment requirement. The Mobility Authority may also suspend the work under this Contract or any work authorization until subconsultants are paid. This requirement also applies to all lower tier subconsultants, and this provision must be incorporated into all subcontracts.

E. Non-compensable Time. Time spent by the Engineer's personnel or subconsultants in an administrative or supervisory capacity not related to the performance of the Services is not compensable and shall not be billed to the Mobility Authority. Time spent on work in excess of what would reasonably be considered appropriate under industry standards for the performance of such Services is not compensable, unless that additional time spent resulted from the Mobility Authority's delay in providing information, materials, feedback, or other necessary cooperation to the Engineer. The Mobility Authority will not pay any hourly compensation to the Engineer for Services or deliverables required due to an error, omission, or fault of the Engineer.

F. Consistency of Classification/Duties and Hourly Rates. Time spent by the Engineer's personnel or subconsultants to perform services or functions capable of being carried out by other, subordinate personnel with a lower hourly rate shall be billed at a rate equivalent to that of the applicable qualified subordinate personnel.

G. Taxes. All payments to be made by the Mobility Authority to the Engineer pursuant to this Contract are inclusive of federal, state, or other taxes, if any, however designated, levied, or based. The Mobility Authority acknowledges and represents that it is a tax-exempt entity under Sections 151.309, et seq., of the Texas Tax Code. A "Texas Sales and Use Tax Exemption Certificate" is available from the Mobility Authority for use toward project-related expenses upon request. Title to any consumable items purchased by the Engineer in performing this Contract shall be deemed to have passed to the Mobility Authority at the time the Engineer takes possession or earlier, and such consumable items shall immediately be marked, labeled, or physically identified as the property of the Mobility Authority, to the extent practicable.

ARTICLE 4. INVOICE REQUIREMENTS

A. Monthly Invoices. The Engineer shall request reimbursement of costs incurred by submitting an itemized invoice in a form acceptable to the Mobility Authority. If the work is eligible for payment through an agreement with another entity, the billing statement shall be in a form and include such detail as that entity may require, including a breakdown of Services provided on a Project-by-Project basis, together with other Services requested by the Mobility Authority. The Engineer is authorized to submit requests for reimbursement no more frequently than monthly and no later than ninety (90) days after costs are incurred, with the exception of the closing of the Mobility Authority's fiscal year. Notwithstanding the ninety (90) day submittal deadline, all requests for reimbursement of costs incurred during the Mobility Authority's fiscal year (ending June 30th) must be submitted no later than 15 days after June 30th, or the next business day if that date should occur on a weekend or holiday.

B. Form of Invoice. The invoice shall show the work authorization number for each work authorization included in the billing, the total amount earned to the date of submission, and the amount due and payable as of the date of the current billing statement for each work authorization. The invoice shall indicate if the work has been completed or if the billing is for partial completion of the work. The fixed fee will be paid in proportion to the percentage of work completed per work authorization.

C. Overhead Rates. The Engineer shall use the provisional overhead rate indicated in Attachment E. If a periodic escalation of the provisional overhead rate is specified in Attachment E, the effective date of the revised provisional overhead rate must be included. For lump sum contracts, the overhead rate remains unchanged for the entire Contract Period.

D. Thirty Day Payments. Upon receipt of an invoice that complies with all invoice requirements set forth in this Article, the Mobility Authority shall make a good faith effort to pay the amount which is due and payable within thirty (30) days. If the Mobility Authority disputes a request for payment by the Engineer, the Mobility Authority agrees to pay any undisputed portion of the invoice within this 30-day window. The Mobility Authority shall notify the Engineer of the disputed amount no later than the 21st day after the date the Mobility Authority receives the monthly invoice.

E. Withholding Payments. The Mobility Authority reserves the right to withhold payment of up to 110% of the disputed amount of the Engineer's invoice in the event of any of the following: (1) If a dispute over the work or costs thereof is not resolved within a thirty day period; (2) pending verification of satisfactory work performed; or (3) required reports (including third-party verifications, if any) are not received. In the event that payment is withheld, the Mobility Authority shall notify the Engineer and give a remedy that would allow the Mobility Authority to release the payment.

F. Invoice and Progress Report Submittal Process.

(1) The invoice submittal shall include:

- Progress report
- Forecast for completion of the scope
- Invoice (in the required format provided by the Mobility Authority)
- Disadvantaged Business Enterprise (DBE)/Historically Underutilized Business (HUB) Forms, as required
- Supporting documents as requested

(2) A progress report shall be submitted to the Mobility Authority at least once each calendar month;

(3) An update to the Project schedule (using critical path method analysis) indicating the Project's overall status versus the baseline schedule (originally submitted with the Project Management Plan) shall be submitted to the Mobility Authority at least once each calendar month;

(4) In the event that invoices are not submitted on a monthly basis, a monthly submittal of the progress report and Project schedule information will be required nevertheless;

(5) The invoice submittal shall not be later than the 10th day of the month following service unless otherwise directed; if submitted after the 10th day, it will be processed the following month;

(6) As it relates to the Mobility Authority's end of fiscal year closeout efforts, the Engineer shall submit the invoice including their services through June 30th for a given year no later than 15 days after June 30th, or the next business day if that date should occur on a weekend or holiday;

(7) The Mobility Authority's Director of Engineering and/or the Mobility Authority's General Engineering Consultant (GEC) will review the invoices to confirm that supporting documentation is included, and for compliance with the Contract and consistency with the submitted progress report; and

(8) The invoice will either be recommended for approval by the Mobility Authority's Director of Engineering and/or GEC, or the Mobility Authority's Director of Engineering and/or GEC will return it to the Engineer for required correction.

G. Effect of Payments. No payment by the Mobility Authority shall relieve the Engineer of its obligation to perform on a timely basis the Services required under this Contract. If, prior to acceptance of any Service, product or other deliverable, the Executive Director determines that said Service, product or deliverable does not satisfy the requirements of this Contract, the Executive Director may reject same and require the Engineer to correct or cure same within a reasonable period of time and at no additional cost to the Mobility Authority.

H. Audit. The Mobility Authority shall have the right to examine the books and records of the Engineer. The Engineer shall maintain all books, documents, papers, accounting records and other evidence pertaining to cost incurred and shall make such materials available at its office during the Contract Period and for four (4) years from the date of final payment under this Contract or until any pending litigation has been completely and fully

resolved, and the Executive Director approves of the destruction of records, whichever occurs last. The Mobility Authority or any of its duly authorized representatives, TxDOT, Texas State Auditor, the Federal Highway Administration ("FHWA"), the United States Department of Transportation Office of Inspector General and the Comptroller General shall have access to any and all books, documents, papers and records of the Engineer which are directly pertinent to this Contract for the purpose of making audits, examinations, excerpts and transcriptions.

ARTICLE 5. WORK AUTHORIZATIONS. The Executive Director will issue work authorizations to authorize all work under this contract. Refusal to accept a work authorization in the form prescribed by the Mobility Authority may be grounds for termination of the contract. The Mobility Authority shall not be responsible for actions by the Engineer or any costs incurred by the Engineer relating to work not directly associated with or prior to the full execution of a work authorization. Terms and conditions governing the use of work authorizations are set forth in Attachment A, General Provisions, Article 1.

ARTICLE 6. SIGNATORY WARRANTY. The undersigned signatory for the Engineer hereby represents and warrants that he or she is an officer of the organization for which he or she has executed this Contract and that he or she has full and complete authority to enter into this Contract on behalf of the firm. These representations and warranties are made for the purpose of inducing the Mobility Authority to enter into this Contract.

ARTICLE 7. NOTICES. A notice, demand, request, report, and other communication required or permitted under this Contract, or which any party may desire to give, shall be in writing and shall be deemed to have been given on the sooner to occur of (i) receipt by the party to whom the notice is hand-delivered, with a written receipt of notice provided by the receiving party, or (ii) two days after deposit in a regularly maintained express mail receptacle of the United States Postal Service, postage prepaid, or registered or certified mail, return receipt requested, express mail delivery, addressed to such party at their address set forth below, or to such other address as a party may from time to time designate under this article, or (iii) receipt of an electronic mail transmission (attaching scanned documents in a format such as .pdf or .tif) for which confirmation of receipt by the other party has been obtained by the sending party:

<p>Engineer:</p> <p>BGE, Inc. Project Manager 10777 Westheimer, Suite 400 Houston, Texas 77042</p>	<p>Mobility Authority:</p> <p>Director of Engineering Central Texas Regional Mobility Authority 3300 N Interstate 35 Frontage Rd #300 Austin, Texas 78705</p>
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ARTICLE 8. INCORPORATION OF PROVISIONS. Attachments A through H are attached hereto and incorporated into this Contract as if fully set forth herein.

ARTICLE 9. ENTIRETY OF AGREEMENT. This writing, including attachments and addenda, if any, embodies the entire agreement and understanding between the parties hereto, and there are no agreements and understandings, oral or written, with reference to the subject matter hereof that are not merged herein and superseded hereby. No alteration, change or modification of the terms of the Contract shall be valid unless made in writing signed by both parties hereto.

ARTICLE 10. PRIORITY OF DOCUMENTS/ORDER OF PRECEDENCE. In the event of any conflict between the Contract and other documents, the order of precedence shall be as set forth below: A) Supplemental Work Authorization; B) Work Authorization; C) Contract Amendments; D) Contract; E) RFP/ RFQ; F) Engineer's Response to RFP/RFQ.

ARTICLE 11. ROLE OF THE GEC. The Mobility Authority will utilize a GEC to assist in its management of this Contract. The GEC is an independent contractor and is authorized by the Mobility Authority to provide the management and technical direction for this Contract on behalf of the Mobility Authority, provided that the GEC is not an agent of the Mobility Authority. All the technical and administrative provisions of the Contract may be managed by the GEC, and the Engineer shall comply with all of the GEC's directives that are within the purview

of the Contract. Decisions concerning Contract amendments and adjustments, such as time extensions and Supplemental Work Authorizations, shall be made by the Executive Director, unless otherwise specified; however, requests for such amendments or adjustments may be made through the GEC, who shall forward such requests to the Executive Director with its comments and recommendations.

Should any dispute arise between the GEC and the Engineer, concerning the conduct of this Contract, either party may request a resolution of said dispute by the Executive Director, whose decision shall be final.

Each party is signing this agreement on the date stated under that party's signature.

THE ENGINEER

**CENTRAL TEXAS REGIONAL MOBILITY
AUTHORITY**

(Signature)

Colby Harris, P.E.

(Printed Name)

Director, Construction Management

(Title)

(Date)

(Signature)

James M. Bass

(Printed Name)

Executive Director

(Title)

(Date)

**Attachments and Exhibits to Contract for Engineering Services
Incorporated into the Contract by Reference**

Attachments	Title
A	General Provisions
B	Services to Be Provided by the Mobility Authority
C	Services to Be Provided by the Engineer
D	Not Applicable
E	Fee Schedule
F	Work Schedule
G	Computer Graphics Files for Document and Information Exchange, if applicable
H	Subcontracting

ATTACHMENT A**GENERAL PROVISIONS
INDEX TO PROVISIONS**

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2	Progress
3	Suspension of Work Authorization
4	Additional Work
5	Changes in Work
6	Supplemental Agreements
7	Data Ownership
8	Public Information and Confidentiality
9	Personnel, Equipment and Material
10	Subcontracting
11	Inspection of Work
12	Submission of Reports
13	Violation of Contract Terms
14	Termination
15	Compliance with Laws
16	Indemnification
17	Engineer's Responsibility
18	Noncollusion
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33	Audit Requirements
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35	Pertinent Non-Discrimination Authorities
36	Boycott Israel
37	Firearm Entities and Trade Associations Discrimination
38	Energy Company Boycott
39	Abbreviations and Definitions

ATTACHMENT A

GENERAL PROVISIONS

ARTICLE 1. WORK AUTHORIZATIONS

A. Use. The Engineer shall not begin any work until the Executive Director and the Engineer have signed a Work Authorization and the Engineer has received a Notice to Proceed as defined in the Work Authorization. Costs incurred by the Engineer before a Work Authorization is fully executed or after the completion date specified in the Work Authorization are not eligible for reimbursement. The Executive Director will issue Work Authorizations to authorize all work under this Contract. All work must be completed on or before the completion date specified in the Work Authorization.

B. Contents. Each Work Authorization shall include: (1) scope of Services including types of Services to be performed and a full description of the work required to perform those Services (2) a full description of general administration tasks exclusive to that Work Authorization (3) a work schedule (including beginning and ending dates) with milestones; (4) the basis of payment whether cost-plus, unit cost, lump sum, or specified rate; (5) a Work Authorization budget using fees set forth in Attachment E Fee, Schedule.; and (6) DBE/HUB Requirements. The Engineer shall not include additional contract terms and conditions in the Work Authorization. In the event of any conflicting terms and conditions between the Work Authorization and the contract, the terms and conditions of the contract shall prevail and govern the work and costs incurred.

C. Work Authorization Budget. A Work Authorization budget shall be prepared by the Engineer and set forth in detail (1) the computation of the estimated cost of the work as described in the Work Authorization, (2) the estimated time (hours/days) required to complete the work at the hourly rates established in Attachment E, Fee Schedule; (3) a work plan that includes a list of the work to be performed, (4) a stated maximum number of calendar days to complete the work, and (5) a cost-not-to-exceed-amount or unit or lump sum cost and the total cost or price of the Work Authorization. The Mobility Authority will not pay items of cost that are not included in or rates that exceed those approved in Attachment E.

D. No Guaranteed Work. Work Authorizations are issued at the sole discretion of the Executive Director. While it is the Executive Director's intent to issue Work Authorizations hereunder, the Engineer shall have no cause of action conditioned upon the lack or number of Work Authorizations issued.

E. Incorporation into Contract. Each Work Authorization shall be signed by both parties and become a part of the Contract. No Work Authorization will waive the Mobility Authority's or the Engineer's responsibilities and obligations established in this Contract. The Engineer shall promptly notify the Mobility Authority of any event that will affect completion of the Work Authorization.

F. Supplemental Work Authorizations. Before additional work may be performed or additional costs incurred beyond those authorized in a Work Authorization, a change in a Work Authorization shall be enacted by a written Supplemental Work Authorization executed within the period of performance specified in the Work Authorization. The Mobility Authority shall not be responsible for actions by the Engineer or any costs incurred by the Engineer relating to additional work not directly associated with the performance or prior to the execution of the Supplemental Work Authorization. The Engineer shall allow adequate time for review and approval of the Supplemental Work Authorization by the Executive Director prior to expiration of the Work Authorization. Any Supplemental Work Authorization must be executed by both parties within the Contract Period established in Article 2 of the Contract.

F-1. More Time Needed. If the Engineer determines or reasonably anticipates that the work authorized in a Work Authorization cannot be completed before the specified completion date, the Engineer shall promptly notify the Executive Director. The Executive Director may, at his sole discretion, extend the Work Authorization period by execution of a Supplemental Work Authorization.

F-2. Changes in Scope. Changes that would modify the scope of the work authorized in a Work Authorization must be enacted by a written Supplemental Work Authorization. If the change in scope affects the amount payable under the Work Authorization, the Engineer shall prepare a revised Work Authorization budget for the Executive Director's approval. The Engineer must allow adequate time for

the Executive Director to review, negotiate, and approve any request for a Supplemental Work Authorization prior to expiration of the Work Authorization.

G. Deliverables. Upon satisfactory completion of the Work Authorization, the Engineer shall submit a letter of completion along with the deliverables as specified in the executed Work Authorization to the Executive Director for review and acceptance.

ARTICLE 2. PROGRESS

A. Progress meetings. As required and detailed in the Work Authorizations or as otherwise directed by the Executive Director, the Engineer shall from time to time during the progress of the work confer with the Executive Director. The Engineer shall prepare and present such information as may be pertinent and necessary or as may be requested by the Executive Director in order to evaluate features of the work.

B. Conferences. At the request of the Executive Director and as required and detailed in the Work Authorizations, conferences shall be held at the Engineer's office, the office of the Mobility Authority, or at other locations designated by the Executive Director. These conferences may also include evaluation of the Engineer's Services and work when requested by the Executive Director.

C. Inspections. If federal funds are used to reimburse costs incurred under this contract, the work and all reimbursements will be subject to periodic review by the U. S. Department of Transportation.

D. Reports. The Engineer shall promptly advise the Executive Director in writing of events that have a significant impact upon the progress of a Work Authorization, including:

1. problems, delays, adverse conditions that will materially affect the ability to meet the time schedules and goals, or preclude the attainment of project work units by established time periods; this disclosure will be accompanied by statement of the action taken or contemplated, and any State or federal assistance needed to resolve the situation; and
2. favorable developments or events which enable meeting the work schedule goals sooner than anticipated.

E. Corrective Action. Should the Executive Director determine that the progress of work does not satisfy the work schedule or other deadlines set forth in a Work Authorization, the Executive Director shall review the work schedule with the Engineer to determine the nature of corrective action needed. The Executive Director's participation in reviewing the work schedule and determining corrective actions needed will not, in any way, excuse the Engineer from any responsibility or costs associated with the failure to timely perform the Services.

ARTICLE 3. SUSPENSION OF WORK AUTHORIZATION

A. Notice. Should the Executive Director desire to suspend a Work Authorization but not terminate the contract, the Executive Director may provide written notification to the Engineer, giving ten (10) business days prior notice. Both parties may waive the ten (10) business day notice requirement in writing.

B. Reinstatement. All or part of a Work Authorization may be reinstated and resumed in full force and effect within thirty (30) days of receipt of written notice from the Executive Director to resume the work. Both parties may waive the thirty-day notice in writing.

C. Contract Period Not Affected. If the Executive Director suspends a Work Authorization, the Contract Period as determined in Article 2 of the Contract is not affected and the contract and the Work Authorization will terminate on the date specified unless the contract is amended to authorize additional time.

D. Limitation of Liability. The Mobility Authority shall have no liability for work performed or costs incurred prior to the date authorized by the Executive Director to begin work, during periods when work is suspended, or after the completion of the contract or Work Authorization.

ARTICLE 4. ADDITIONAL WORK

A. Notice. If the Engineer is of the opinion that any assigned work is beyond the scope of a Work Authorization and constitutes additional work beyond the Services to be provided under the Work Authorization, it shall promptly notify the Executive Director and submit written justification presenting the facts of the work and demonstrating how the work constitutes supplementary work.

B. Supplemental Agreement. If the Executive Director finds that the work does constitute additional work, the Executive Director shall so advise the Engineer and a written supplemental agreement will be executed as provided in General Provisions, Article 6, Supplemental Agreements.

C. Limitation of Liability. The Mobility Authority shall not be responsible for actions by the Engineer or any costs incurred by the Engineer relating to additional work not directly associated with or prior to the execution of a supplemental agreement.

ARTICLE 5. CHANGES IN WORK

A. Work Previously Submitted as Satisfactory. If the Engineer has submitted work in accordance with the terms of this Contract and Work Authorization(s) but the Executive Director requests changes to the completed work or parts thereof which involve changes to the original scope of Services or character of work under the Contract and Work Authorization(s), the Engineer shall make such revisions as requested and as directed by the Executive Director, provided the work is reflected in a Supplemental Work Authorization.

B. Work Does Not Comply with Contract. If the Engineer submits work that does not comply with the terms of this Contract or Work Authorization(s), the Executive Director shall instruct the Engineer to make such revision as is necessary to bring the work into compliance with the Contract or Work Authorization(s). No additional compensation shall be paid for these revisions or re-work.

C. Errors/Omissions. The Engineer shall make revisions to the work authorized in this contract which are necessary to correct errors or omissions appearing therein, when required to do so by the Executive Director. No additional compensation shall be paid for this work.

ARTICLE 6. SUPPLEMENTAL AGREEMENTS

A. Need. The terms of this contract may be modified if the Executive Director determines that there has been a significant increase or decrease in the duration, scope, cost, complexity or character of the services to be performed. A supplemental agreement will be executed to authorize such significant increases or decreases.

B. When to Execute. Both the Engineer and the Executive Director must execute a supplemental agreement within the Contract Period specified in Article 2 of the Contract.

ARTICLE 7. DATA OWNERSHIP

A. Work for Hire. All services provided under this contract are considered work for hire and as such all data, basic sketches, charts, calculations, plans, specifications, and other documents created or collected under the terms of this contract are the property of the Mobility Authority.

B. Ownership of Plans. Notwithstanding any provision in this Contract or in common law or statute to the contrary all of the plans, tracings, estimates, specifications, computer records, discs, tapes, proposals, sketches, diagrams, charts, calculations, correspondence, memoranda, survey notes, and other data and materials, and any part thereof, created, compiled or to be compiled by or on behalf of the Engineer, including all information prepared for or posted on the Mobility Authority's website and together with all materials and data furnished to it by the Mobility Authority, are and at all times shall be and remain the property of the Mobility Authority and shall not be subject to any restriction or limitation on their further use by or on behalf of the Mobility Authority. Engineer hereby assigns any and all rights and interests it may have in the foregoing to the Mobility Authority, and Engineer hereby agrees to provide reasonable cooperation as may be requested by the Mobility Authority in connection with the Mobility Authority's efforts to perfect or protect rights and interests in the foregoing; and if at any time demand be made by the Mobility Authority for any of the above materials, records, and documents, whether after termination of this Contract or otherwise, such shall be turned over to the Mobility Authority without delay. The Mobility Authority hereby grants the Engineer a revocable license to retain and utilize the foregoing materials for the limited purpose of fulfilling Engineer's obligations under this Contract, said license to terminate and expire upon the earlier to occur of (a) the completion of Services described in this Contract or (b) the termination of this Contract, at which time the Engineer shall deliver to the Mobility Authority all such materials and documents. If the Engineer or a subconsultant desires later to use any of the data generated or obtained by it in connection with any Project or any other portion of the work product resulting from the Services, it shall secure the prior written approval of the Executive Director. The Engineer shall retain its copyright and ownership rights in its own back-office databases and computer software that are

not developed for the Mobility Authority or for purposes of this Contract. Intellectual property developed, utilized, or modified in the performance of Services for which the Engineer is compensated under the terms of this Contract shall remain the property of the Mobility Authority, Engineer hereby agrees to provide reasonable cooperation as may be requested by the Mobility Authority in connection with the Mobility Authority's efforts to perfect or protect such intellectual property. The Mobility Authority retains an unrestricted license for software packages developed in whole or in part with Mobility Authority funds.

C. Separate Assignment. If for any reason the agreement of the Mobility Authority and the Engineer set forth in subarticle 7.B regarding the ownership of work product and other materials is determined to be unenforceable, either in whole or in part, the Engineer hereby assigns and agrees to assign to the Mobility Authority all right, title, and interest that Engineer may have or at any time acquire in said work product and other materials, without royalty, fee or additional consideration of any sort, and without regard to whether this Contract has terminated or remains in force. The Mobility Authority hereby acknowledges, however, that all documents and other work product provided by the Engineer to the Mobility Authority and resulting from the Services performed under this Contract are intended by the Engineer solely for the use for which they were originally prepared. Notwithstanding anything contained herein to the contrary, the Engineer shall have no liability for the use by the Mobility Authority of any work product generated by the Engineer under this Contract on any Project other than for the specific purpose and Project for which the work product was prepared.

D. Disposition of Documents. All documents prepared by Engineer and all documents furnished to Engineer by the Mobility Authority shall be delivered to the Mobility Authority upon request. Engineer, at its own expense, may retain copies of such documents or any other data which it has furnished the Mobility Authority under this contract, but further use of the data is subject to permission by the Mobility Authority.

E. Release of Design Plan. The Engineer (1) will not release any roadway design plan created or collected under this contract except to its subconsultants as necessary to complete the contract; (2) shall include a provision in all subcontracts which acknowledges the Mobility Authority's ownership of the design plan and prohibits its use for any use other than the project identified in this contract; and (3) is responsible for any improper use of the design plan by its employees, officers, or subconsultants, including costs, damages, or other liability resulting from improper use. Neither Engineer nor any subconsultant may charge a fee for any portion of the design plan created by the Mobility Authority."

ARTICLE 8. PUBLIC INFORMATION AND CONFIDENTIALITY

A. Public Information. The Mobility Authority will comply with Government Code, Chapter 552, (the "Public Information Act") in the release of information produced under this Contract. The requirements of Subchapter J, of the Public Information Act, may apply to this Contract and the Engineer agrees that the Contract can be terminated if the Engineer knowingly or intentionally fails to comply with a requirement of that subchapter.

B. Confidentiality. The Engineer shall not disclose information obtained from the Mobility Authority under this contract without the express written consent of the Executive Director. All employees of the Engineer and its subconsultants working on the Project may be required to sign a non-disclosure and confidentiality agreement.

C. Access to Information. The Engineer is required to make any information created or exchanged with the Mobility Authority pursuant to this contract, and not otherwise excepted from disclosure under the Texas Public Information Act, available in a format that is accessible by the public at no additional charge to the Mobility Authority.

ARTICLE 9. PERSONNEL, EQUIPMENT AND MATERIAL

A. Engineer Resources. The Engineer shall furnish and maintain an office for the performance of all services, in addition to providing adequate and sufficient personnel and equipment to perform the services required under the contract. The Engineer certifies that it presently has adequate qualified personnel in its employment for performance of the services required under this contract, or it will be able to obtain such personnel from sources other than the Mobility Authority.

B. Removal of Employee. All employees of the Engineer assigned to this contract shall have such knowledge and experience as will enable them to perform the duties assigned to them. The Executive Director

may instruct the Engineer to remove any employee from association with work authorized in this contract if, in the sole opinion of the Executive Director, the work of that employee does not comply with the terms of this contract or if the conduct of that employee becomes detrimental to the work; or for any other reason identified by the Executive Director.

C. Mobility Authority Approval of Replacement Personnel. The Engineer may not replace any Key Team Member, as designated in the applicable Work Authorization, without prior written approval of the Director of Engineering. If any Key Team Member cease to work on this Contract, the Engineer must notify the Director of Engineering in writing as soon as possible, but in any event within (3) three business days. The notification must give the reason for removal. The Engineer must receive written approval from the Director of Engineering of proposed replacement Key Team Member. The Director of Engineering's approval will be based upon the proposed replacement Key Team Member qualifications to provide the required Services. Approval will not be unreasonably withheld.

D. Liquidated Damages. The selection of Engineer to provide the Services under this Contract was based, in part, on the Key Team Member identified in Engineer's proposal. Because of the importance and unique nature of the Services to be provided by Key Team Member identified in Attachment C it is impractical to calculate the actual losses that would be suffered by the Mobility Authority by the loss of Key Team Member from the Contract. Therefore, the Engineer agrees to compensate the Mobility Authority for its losses by paying liquidated damages in the amount of \$2,500 per day per Key Team Member position in Attachment C if any Key Team Member is removed by the Engineer by reassignment without prior written approval from the Director of Engineering. Liquidated damages will accrue from the date the Engineer removes the Key Team Member in Attachment C from the Contract if the parties do not agree on a replacement within (14) calendar days after the Key Team Member are removed from the Contract. If a replacement is agreed upon within that fourteen (14) calendar day period the liquidated damages will be waived. Liquidated damages shall cease when the parties agree on a substitute or when the Contract is terminated.

E. Ownership of Acquired Property. Except to the extent that a specific provision of this contract states to the contrary, and as provided in subarticle 7.B, the Mobility Authority shall own all intellectual property acquired or developed under this contract and all equipment purchased by the Engineer or its subconsultants under this contract. All intellectual property and equipment owned by the Mobility Authority shall be delivered to the Director of Engineering when the contract terminates, or when it is no longer needed for work performed under this Contract, whichever occurs first. In the event that a capital item is purchased for the sole use of the Mobility Authority, title shall pass or transfer to the Mobility Authority upon acquisition and prior to any use of the item by the Engineer.

ARTICLE 10. SUBCONTRACTING

A. Prior Approval. The Engineer shall not assign, subcontract, or transfer any portion of Services related to the work under this Contract unless specified in an executed Work Authorization or otherwise without first obtaining the prior written approval from the Executive Director. Request for approval should include a written description of the proposed services, and, using rates established in Attachment E, a proposed price.

B. DBE/HUB Compliance. The Engineer's subcontracting program shall comply with the DBE/HUB requirements described in the Work Authorization(s).

C. Required Provisions. All subcontracts for professional services shall include the provisions included in Attachment A, General Provisions, and any provisions required by law.

D. Invoice Approval and Processing. All subconsultants shall prepare and submit their invoices on the same billing cycle and format as the Engineer (so as to be included in invoices submitted by the Engineer).

E. Engineer Responsibilities. No subcontract shall relieve the Engineer of any of its responsibilities under this Contract and of any liability for work performed under this Contract, even if performed by a subconsultant or other third party performing work for or on behalf of the Engineer.

ARTICLE 11. INSPECTION OF WORK

A. Review Rights. Under this Contract, the Mobility Authority, TxDOT, and the U.S. Department of

Transportation, and any authorized representative of the Mobility Authority, TxDOT, or the U.S. Department of Transportation, shall have the right at all reasonable times to inspect, review or otherwise evaluate the work performed hereunder and the premises in which it is being performed.

B. Reasonable Access. If any review or evaluation is made on the premises of the Engineer or a subconsultant under this Article, the Engineer shall provide and require its subconsultants to provide all reasonable facilities and assistance for the safety and convenience of the persons performing the review in the performance of their duties.

ARTICLE 12. SUBMISSION OF REPORTS

All applicable study reports shall be submitted in preliminary form for approval by the Director of Engineering before a final report is issued. The Director of Engineering's comments on the Engineer's preliminary report must be addressed in the final report. Draft reports shall be considered confidential unless otherwise indicated by the Director of Engineering.

ARTICLE 13. VIOLATION OF CONTRACT TERMS

A. Increased Costs. Violation of contract terms, breach of contract, or default by the Engineer shall be grounds for termination of the contract, and any increased or additional cost incurred by the Mobility Authority arising from the Engineer's default, breach of contract or violation of contract terms shall be paid by the Engineer.

B. Remedies. This agreement shall not be considered as specifying the exclusive remedy for any default, and all remedies existing at law and in equity may be availed of by either party and shall be cumulative.

ARTICLE 14. TERMINATION

A. Causes. The contract may be terminated before the stated completion date by any of the following conditions.

1. By mutual agreement and consent, in writing from both parties.
2. By the Executive Director by notice in writing to the Engineer as a consequence of failure by the Engineer to perform the Services set forth herein in a satisfactory manner or if the Engineer violates the provisions of Article 20, Gratuities, or DBE/HUB Requirements.
3. By either party, upon the failure of the other party to fulfill its obligations as set forth herein, following thirty (30) days written notice and opportunity to cure.
4. By the Executive Director for his convenience and in his sole discretion, not subject to the consent of the Engineer, by giving thirty (30) days written notice of termination to the Engineer.
5. By satisfactory completion of all services and obligations described herein.

B. Measurement. Should the Executive Director terminate this Contract as herein provided, no fees other than fees due and payable at the time of termination shall thereafter be paid to the Engineer. In determining the value of the work performed by the Engineer prior to termination, the Executive Director shall be the sole judge. Compensation for work at termination will be based on a percentage of the work completed at that time. Should the Executive Director terminate this Contract under subarticles 14.A.3 & 4, the Engineer shall not incur costs during the thirty-day notice period in excess of the amount incurred during the preceding thirty (30) days.

C. Value of Completed Work. If the Engineer defaults in the performance of this contract or if the Executive Director terminates this contract for fault on the part of the Engineer, the Executive Director will give consideration to the following when calculating the value of the completed work: (1) the actual costs incurred (not to exceed the rates set forth in the applicable Work Authorization) by the Engineer in performing the work to the date of default; (2) the amount of work required which was satisfactorily completed to date of default; (3) the value of the work which is usable to the Mobility Authority; (4) the cost to the Mobility Authority of employing another firm to complete the required work; (5) the time required to employ another firm to complete the work; (6) delays in opening a revenue-generating Project and costs (including lost revenues) resulting therefrom; and (7) other factors which affect the value to the Mobility Authority of the work performed.

D. Excusable Delays. Except with respect to defaults of subconsultants, the Engineer shall not be in default by reason of any failure in performance of this Contract in accordance with its terms (including any failure to progress in the performance of the work) if such failure arises out of causes beyond the control and without the

default or negligence of the Engineer. Such causes may include, but are not restricted to, acts of God or the public enemy, acts of the Government in either its sovereign or contractual capacity, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and unusually severe weather.

E. Surviving Requirements. The termination of this contract and payment of an amount in settlement as prescribed above shall extinguish the rights, duties, and obligations of the Mobility Authority and the Engineer under this contract, except for those provisions that establish responsibilities that extend beyond the Contract Period, including without limitation the provisions of Article 16.

F. Payment of Additional Costs. If termination of this contract is due to the failure of the Engineer to fulfill its contract obligations, the Mobility Authority may take over the project and prosecute the work to completion, and the Engineer shall be liable to the Mobility Authority for any additional cost to the Mobility Authority.

ARTICLE 15. COMPLIANCE WITH LAWS

The Engineer shall comply with all applicable federal, state and local laws, statutes, codes, ordinances, rules and regulations, and the orders and decrees of any court, or administrative bodies or tribunals in any manner affecting the performance of this Contract, including, without limitation, worker's compensation laws, minimum and maximum salary and wage statutes and regulations, nondiscrimination, licensing laws and regulations, the Mobility Authority's enabling legislation (Chapter 370 of the Texas Transportation Code), and all amendments and modifications to any of the foregoing, if any. The Engineer shall comply with all applicable Authority policies and procedures as outlined in the Mobility Authority Policy Code handbook available on the Authority's website (<https://www.mobilityauthority.com/about/policy-disclaimers/code>). When required, the Engineer shall furnish the Mobility Authority with satisfactory proof of its compliance therewith.

ARTICLE 16. INDEMNIFICATION

A. Indemnification. *THE ENGINEER SHALL INDEMNIFY AND HOLD HARMLESS THE MOBILITY AUTHORITY AND ITS OFFICERS, DIRECTORS, EMPLOYEES, AGENTS AND CONSULTANTS WHICH, FOR THE PURPOSES OF THIS CONTRACT, SHALL INCLUDE THE MOBILITY AUTHORITY'S GEC, GENERAL COUNSEL, BOND COUNSEL, FINANCIAL ADVISORS, TRAFFIC AND REVENUE ENGINEERS, TOLL OPERATIONS/COLLECTIONS FIRMS, AND UNDERWRITERS (COLLECTIVELY THE "INDEMNIFIED PARTIES") FROM ANY CLAIMS, COSTS, OR LIABILITIES OF ANY TYPE OR NATURE AND BY OR TO ANY PERSONS WHOMSOEVER, TO THE EXTENT CAUSED BY THE NEGLIGENT ACTS, ERRORS, OR OMISSIONS OF THE ENGINEER OR ITS OFFICERS, DIRECTORS, EMPLOYEES, SUBCONSULTANTS AND AGENTS WITH RESPECT TO THE ENGINEER'S PERFORMANCE OF THE WORK TO BE ACCOMPLISHED UNDER THIS CONTRACT OR ACTIONS RESULTING IN CLAIMS AGAINST THE INDEMNIFIED PARTIES. IN SUCH EVENT, THE ENGINEER SHALL ALSO INDEMNIFY AND HOLD HARMLESS THE MOBILITY AUTHORITY AND ITS OFFICERS, DIRECTORS, AND EMPLOYEES AND THE INDEMNIFIED PARTIES FROM ANY AND ALL REASONABLE AND NECESSARY EXPENSES, INCLUDING REASONABLE ATTORNEYS' FEES, INCURRED BY THE MOBILITY AUTHORITY OR ANY OF THE INDEMNIFIED PARTIES IN LITIGATING OR OTHERWISE RESISTING SAID CLAIMS, COSTS OR LIABILITIES. IN THE EVENT THE MOBILITY AUTHORITY AND ITS OFFICERS, DIRECTORS, AND EMPLOYEES AND/OR ANY OF THE INDEMNIFIED PARTIES, IS/ARE FOUND TO BE PARTIALLY AT FAULT, THE ENGINEER SHALL, NEVERTHELESS, INDEMNIFY THE MOBILITY AUTHORITY AND ITS OFFICERS, DIRECTORS, AND EMPLOYEES AND/OR ANY OF THE INDEMNIFIED PARTIES FROM AND AGAINST THE PERCENTAGE OF FAULT ATTRIBUTABLE TO THE ENGINEER OR ITS OFFICERS, DIRECTORS, EMPLOYEES, SUBCONSULTANTS AND AGENTS OR TO THEIR CONDUCT.*

ARTICLE 17. ENGINEER'S RESPONSIBILITY

A. Accuracy. The Engineer shall have total responsibility for the accuracy and completeness of all work prepared and completed under this Contract and shall check all such material accordingly. The Engineer shall promptly make necessary revisions or corrections resulting from its errors, omissions, or negligent acts without additional compensation.

B. Errors and Omissions. The Mobility Authority and Engineer will address errors and omissions as follows:

1. The Engineer's responsibility for all questions and/or clarification of any ambiguities arising from errors and omissions will be determined by the Executive Director.
2. A problem resulting from an error and omission may be identified during the development of the PS&E, Engineering SpecDelwWA

as well as before, during, or after construction. The Engineer will be responsible for errors and omissions before, during, and after construction of a Project, as well as before and after Contract termination.

3. The phrase error and omission is used throughout to mean an error, an omission, or a combination of error and omission.
4. When an apparent error and omission is identified in work provided by the Engineer, the Executive Director will notify the Engineer of the problem and involve the Engineer in efforts to resolve it and determine the most effective solution, provided that the Executive Director shall ultimately determine the solution that is chosen.
5. Errors and omissions identified during PS&E development/prior to Project construction will be corrected at the Engineer's expense with no additional cost to the Mobility Authority.
6. During and after construction, errors and omissions can potentially result in significant additional costs to the Mobility Authority that they would not have incurred if the construction plans had been correct. The resulting additional costs are considered damages that the Mobility Authority will collect from the Engineer, including through offset to amounts owed to the Engineer.
7. After a Project is constructed and is in use, there is a possibility of a contractor claim that may involve a previous error and omission by the Engineer identified during construction; it is also possible the Engineer could be responsible for some or all of the cost of the contractor claim. If there is a possibility of Engineer responsibility, upon notice of the contractor claim, the Executive Director must notify the Engineer of the situation and provide the Engineer the opportunity to contribute any information to the Executive Director that may be useful in addressing the contractor claim. The Engineer will not be involved in any discussions or negotiations with the contractor during the claims process. Upon settlement of all previous claims with the contractor, if additional costs are identified, the Executive Director should consider the same factors as during construction in determining the Engineer's level of responsibility.
8. The additional costs which are considered damages to the Mobility Authority and are to be recovered should represent actual cost to the Mobility Authority.
9. The Executive Director will not accept in-kind services from the Engineer as payment for additional costs owed.
10. The Engineer is responsible for promptly correcting errors and omissions without compensation. In the situation of a dispute concerning whether or not the work is compensable, the Engineer shall not delay the work.
11. A letter will be transmitted by the Executive Director formally notifying the Engineer of payment required for the error and omission and will indicate the Engineer's apparent liability for the identified additional costs. The letter will include an outline of the errors and omissions, along with the additional costs, and references to any previous points of coordination and preliminary agreements. Within 30 calendar days of the date of the letter, a response is required from the Engineer with: (a) payment, (b) a request for a meeting, or (c) a request for the Executive Director to reconsider whether the Executive Director should pursue reimbursement for the identified error and omission. If a response or payment is not received from the Engineer, the Mobility Authority may pursue legal action against the Engineer, in addition to offset of payments to the Engineer, claims against insurance and other remedies available under the Contract.
12. It is the Executive Director's responsibility to identify errors and omissions and fairly evaluate the responsibility for additional cost when applicable. It is the responsibility of the Mobility Authority staff to ensure that the Mobility Authority's business practices are professional, fair, equitable, and reasonable.

C. Professionalism. The Engineer shall perform the services it provides under the Contract: (1) with the professional skill and care ordinarily provided by competent engineers practicing under the same or similar circumstances and professional license and (2) as expeditiously as is prudent considering the ordinary professional skill and care of a competent engineer.

D. Seal. The responsible Engineer shall sign, seal and date all appropriate engineering submissions to the Mobility Authority in accordance with the Texas Engineering Practice Act and the rules of the Texas Board of Professional Engineers and Land Surveyors.

E. Resealing of Documents. Once the work has been sealed and accepted by the Director of Engineering, the Mobility Authority, as the owner, will notify the party to this contract, in writing, of the possibility that a

Mobility Authority engineer, as a second engineer, may find it necessary to alter, complete, correct, revise or add to the work. If necessary, the second engineer will affix his seal to any work altered, completed, corrected, revised or added. The second engineer will then become responsible for any alterations, additions or deletions to the original design including any effect or impacts of those changes on the original engineer's design.

ARTICLE 18. NONCOLLUSION

A. Warranty. The Engineer warrants that it has not employed or retained any company or person, other than a bona fide employee working solely for the Engineer, to solicit or secure this Contract and that it has not paid or agreed to pay any company or Engineer any fee, commission, percentage, brokerage fee, gifts, or any other consideration, contingent upon or resulting from the award or making of this Contract.

B. Liability. For breach or violation of this warranty, the Mobility Authority shall have the right to annul this Contract without liability or, in its discretion, to deduct from the Contract compensation, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gift or contingent fee.

ARTICLE 19. INSURANCE

The Engineer shall furnish the Mobility Authority a properly completed Certificate of Insurance approved by the Executive Director prior to beginning work under the Contract and shall maintain such insurance through the Contract Period. The Engineer shall provide proof of insurance (and the Professional Liability Insurance discussed herein) in a form reasonably acceptable by the Executive Director. The Engineer certifies that it has and will maintain insurance coverages as follows:

A. Workers Compensation Insurance. In accordance with the laws of the State of Texas and employer's liability coverage with a limit of not less than \$1,000,000. This policy shall be endorsed to include a waiver of subrogation in favor of the Authority.

B. Comprehensive General Liability Insurance. With limits not less than \$1,000,000 for bodily injury, including those resulting in death, and \$1,000,000 for property damage on account of any one occurrence, with an aggregate limit of \$1,000,000.

C. Comprehensive Automobile Liability Insurance. Applying to owned, non-owned, and hired automobiles in an amount not less than \$1,000,000 for bodily injury, including death, to any one person, and \$1,000,000 on account on any one occurrence, and \$1,000,000 for property damage on account of any one occurrence. This policy shall not contain any limitation with respect to a radius of operation for any vehicle covered and shall not exclude from the coverage of the policy any vehicle to be used in connection with the performance of the Engineer's obligations under this Contract.

D. Excess Liability Insurance. In an amount of \$2,000,000 per occurrence and aggregate.

E. Valuable Papers Insurance. In an amount sufficient to assure the full restoration of any plans, drawings, field notes, logs, test reports, diaries, or other similar data or materials relating to the Services provided under this Contract in the event of their loss or destruction, until such time as the work has been delivered to the Authority.

F. Architects and/or Engineers Professional Liability insurance. Engineer shall provide and maintain professional liability coverage, with limits not less than \$2,000,000 per claim and \$2,000,000 aggregate. The professional liability coverage shall protect against any negligent act, error or omission arising out of design or engineering activities, including environmental related activities, with respect to the Project, including coverage for negligent acts, errors or omissions by any member of the Engineer and its subconsultants (including, but not limited to design subconsultants and subconsultants) of any tier. The policy must provide that coverage extends a minimum of three (3) years beyond the Engineer's completion of the Services. This policy shall be endorsed to include a waiver of subrogation in favor of the Authority.

G. General for All Insurance. The Engineer shall promptly, upon execution of this Contract, furnish certificates of insurance to the Executive Director indicating compliance with the above requirements.

Certificates shall indicate the name of the insured, the name of the insurance company, the name of the agency/agent, the policy number, the term of coverage, and the limits of coverage.

All policies are to be written through companies (a) authorized to transact that class of insurance in the State of Texas; (b) rated (i), with respect to the companies providing the insurance under subarticles 19.A. through D., above, by A. M. Best Company as "A-X" or better (or the equivalent rating by another nationally recognized rating service) and (ii) with respect to the company providing the insurance under subarticle 19.E., a rating by A. M. Best Company or similar rating service satisfactory to the Mobility Authority and/or its insurance consultant; and (c) otherwise acceptable to the Executive Director.

All policies are to be written through companies authorized to transact that class of insurance in the State of Texas. Such insurance shall be maintained in full force and effect during the life of this Contract or for a longer term as may be otherwise provided for hereunder. Insurance furnished under subarticles 19.B., C., and D., above, shall name the Mobility Authority as additional insured and shall protect the Authority, its officers, employees, and directors, agents, and representatives from claims for damages for bodily injury and death and for damages to property arising in any manner from the negligent or willful acts or failures to act by the Engineer, its officers, employees, directors, agents, and representatives in the performance of the Services rendered under this Contract. Certificates shall also indicate that the contractual liability assumed in Article 16, above, is included.

The insurance carrier shall include in each of the insurance policies required under subarticles 19.A. through F., the following statement: "This policy will not be canceled or materially changed during the period of coverage without at least thirty (30) days prior written notice addressed to the Central Texas Regional Mobility Authority, 3300 N. IH-35, Suite 300, Austin, Texas 78705, Attn: Executive Director"

H. Subconsultant. The Engineer shall be liable for work performed by the subconsultant and Engineer's insurance shall cover the work, actions, errors and omissions of the subconsultant.

ARTICLE 20. GRATUITIES

A. Employees Not to Benefit. Mobility Authority policy mandates that the director, employee or agent of the Mobility Authority shall not accept any gift, favor, or service that might reasonably tend to influence the director, employee or agent in making of procurement decisions. The only exceptions allowed are ordinary business lunches and items that have received the advance written approval of the Executive Director of the Mobility Authority.

B. Liability. Any person doing business with or who reasonably speaking may do business with the Mobility Authority under this Contract may not make any offer of benefits, gifts or favors to Mobility Authority employees, except as mentioned above. Failure on the part of the Engineer to adhere to this policy may result in the termination of this Contract.

ARTICLE 21. DISADVANTAGED BUSINESS ENTERPRISE OR HISTORICALLY UNDERUTILIZED BUSINESS REQUIREMENTS

The Engineer agrees to comply with the DBE/HUB requirements and reporting guidelines set forth in the Work Authorization(s). The DBE/HUB Goal established for this Project is as set forth in the Work Authorization. The Engineer also agrees to comply with the DBE/HUB subcontracting plan that was included in the response that the Engineer submitted to the Mobility Authority's Request for Qualifications or Request for Proposals.

ARTICLE 22. MAINTENANCE, RETENTION AND AUDIT OF RECORDS

A. Retention Period. The Engineer shall maintain all books, documents, papers, accounting records and other evidence pertaining to costs incurred and Services provided (hereinafter called the Records). The Engineer shall make the Records available at its office during the Contract Period and for four (4) years from the date of final payment under this Contract, until completion of all audits, or until pending litigation has been completely and fully resolved, whichever occurs last.

B. Availability. The Mobility Authority shall have the exclusive right to examine the books and records of the Engineer for the purpose of checking the amount of work performed by the Engineer. The Engineer shall maintain all books, documents, papers, accounting records and other evidence pertaining to cost incurred and shall make such materials available at its office during the Contract Period and for four (4) years from the date of final payment under this Contract or until pending litigation has been completely and fully resolved,

whichever occurs last. The Mobility Authority or any of its duly authorized representatives, TxDOT, FHWA, the United States Department of Transportation Office of Inspector General, and the Comptroller General shall have access to any and all books, documents, papers and records of the Engineer which are directly pertinent to this Contract for the purpose of making audits, examinations, excerpts and transcriptions.

ARTICLE 23. CERTIFICATE OF INTERESTED PARTIES

If applicable, the Engineer must comply with the Certificate of Interested Parties (Form 1295) adopted by the Texas Legislature as House Bill 1295, which added section 2252.908 of the Government Code, available for review at the Texas Ethics Commission website: <https://www.ethics.state.tx.us/>.

ARTICLE 24. CIVIL RIGHTS COMPLIANCE

A. Compliance with Regulations: The Engineer shall comply with the Acts and Regulations relative to Nondiscrimination in Federally-assisted programs of the U.S. Department of Transportation (USDOT), the Federal Highway Administration (FHWA), as they may be amended from time to time, which are herein incorporated by reference and made part of this contract.

B. Nondiscrimination: The Engineer, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, sex, or national origin in the selection and retention of subconsultants, including procurement of materials and leases of equipment. The Engineer will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.

C. Solicitations for Subcontracts, Including Procurement of Materials and Equipment: In all solicitations either by competitive bidding or negotiation made by the Engineer for work to be performed under a subcontract, including procurement of materials or leases of equipment, each potential subconsultant or supplier will be notified by the Engineer of the Engineer's obligations under this contract and the Acts and Regulations relative to Nondiscrimination on the grounds of race, color, sex, or national origin.

D. Information and Reports: The Engineer will provide all information and reports required by the Acts and Regulations, and directives issued pursuant thereto, and will permit access to its books, records, accounts, other sources of information, and facilities as may be determined by the Mobility Authority or the FHWA to be pertinent to ascertain compliance with such Acts and Regulations or directives. Where any information required of the Engineer is in the exclusive possession of another who fails or refuses to furnish this information, the Engineer will so certify to the Mobility Authority or the Federal Highway Administration, as appropriate, and will set forth what efforts it has made to obtain the information.

E. Sanctions for Noncompliance: In the event of the Engineer's noncompliance with the Nondiscrimination provisions of this contract, the Mobility Authority will impose such contract sanctions as it or the FHWA may determine to be appropriate, including, but not limited to:

- (1) withholding of payments to the Engineer under the contract until the Engineer complies and/or
- (2) cancelling, terminating, or suspending of the contract, in whole or in part.

F. Incorporation of Provisions: The Engineer will include the provisions of paragraphs (A) through (E) in every subcontract, including procurement of materials and leases of equipment, unless exempt by the Acts and Regulations and directives issued pursuant thereto. The Engineer will take such action with respect to any subcontract or procurement as the Mobility Authority, TxDOT, or the FHWA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the Engineer becomes involved in, or is threatened with, litigation with a subcontractor or supplier because of such direction, the Engineer may request the Mobility Authority to enter into such litigation to protect the interests of the Mobility Authority.

ARTICLE 25. PATENT RIGHTS

The Mobility Authority shall have the royalty free, nonexclusive and irrevocable right to use and to authorize others to use any patents developed by the Engineer under this contract.

ARTICLE 26. COMPUTER GRAPHICS FILES

The Engineer agrees to comply with Attachment G, Computer Graphics Files for Document and Information

Exchange, if determined by the Mobility Authority to be applicable to this contract.

ARTICLE 27. CHILD SUPPORT CERTIFICATION

Under Section 231.006, Texas Family Code, the Engineer certifies that the individual or business entity named in this contract, bid, or application is not ineligible to receive the specified grant, loan, or payment and acknowledges that this contract may be terminated and payment may be withheld if this certification is inaccurate. If the above certification is shown to be false, the Engineer is liable to the state for attorney's fees, the cost necessary to complete the contract, including the cost of advertising and awarding a second contract, and any other damages provided by law or the contract. A child support obligor or business entity ineligible to receive payments because of a payment delinquency of more than thirty (30) days remains ineligible until: all arrearages have been paid; the obligor is in compliance with a written repayment agreement or court order as to any existing delinquency; or the court of continuing jurisdiction over the child support order has granted the obligor an exemption from Subsection (a) of Section 231.006, Texas Family Code, as part of a court-supervised effort to improve earnings and child support payments.

ARTICLE 28. DISPUTES

A. Disputes Not Related to Contract Services. The Engineer shall be responsible for the settlement of all contractual and administrative issues arising out of any procurement made by the Engineer in support of the services authorized herein.

B. Disputes Concerning Work or Cost. The Executive Director of the Mobility Authority shall decide all questions, difficulties and disputes of any nature whatsoever that may arise under or by reason of this Contract, and his decision upon all claims, questions and disputes shall be final. The Engineer shall comply with the decision of the Executive Director with regard to the resolution of any such disputes.

ARTICLE 29. SUCCESSORS AND ASSIGNS

The Engineer and the Mobility Authority do each hereby bind themselves, their successors, executors, administrators and assigns to each other party of this Contract and to the successors, executors, administrators and assigns of such other party in respect to all covenants of this contract. The Engineer shall not assign, subcontract or transfer its interest in this contract without the prior written consent of the Executive Director.

ARTICLE 30. SEVERABILITY

In the event any one or more of the provisions contained in this Contract shall for any reason be held to be invalid, illegal, or unenforceable in any respect, such invalidity, illegality, or unenforceability shall not affect any other provision thereof and this Contract shall be construed as if such invalid, illegal, or unenforceable provision had never been contained herein.

ARTICLE 31. PRIOR CONTRACTS SUPERSEDED

This Contract, including all attachments, constitutes the sole agreement of the parties hereto for the Services authorized herein and supersedes any prior understandings or written or oral contracts between the parties respecting the subject matter defined herein.

ARTICLE 32. CONFLICT OF INTEREST

A. Representation by Engineer.

The Engineer represents that it has no conflict of interest that would in any way interfere with its or its employees' performance of Services for the Mobility Authority or which in any way conflicts with the interests of the Mobility Authority and certifies that it is in full compliance with the Mobility Authority's Policy Code related to Conflicts of Interest. The Engineer shall prevent any actions or conditions that could result in a conflict with the Mobility Authority's interests.

B. Certification Status. The Engineer certifies that it is not:

1. a person required to register as a lobbyist under Chapter 305, Government Code;
2. a public relations firm; or
3. a government consultant.

C. Environmental Disclosure. If the Engineer will prepare an environmental impact statement or an

environmental assessment under this Contract, the Engineer certifies by executing this Contract that it has no financial or other interest in the outcome of the Project on which the environmental impact statement or environmental assessment is prepared.

D. Engineering Services for the Construction Contractor. Specific to the Project for which the Services are being provided under this Contract, the Engineer shall not provide services directly to the contractor responsible for constructing the Project unless approved by the Executive Director.

ARTICLE 33. AUDIT REQUIREMENTS

The parties shall comply with the requirements of the Single Audit Act of 1984, P.L. 98-502, ensuring that the single audit report includes the coverage stipulated in 2 CFR 200.

ARTICLE 34. DEBARMENT CERTIFICATIONS

The parties are prohibited from making any award at any tier to any party that is debarred or suspended or otherwise excluded from or ineligible for participation in Federal Assistance Programs under Executive Order 12549, "Debarment and Suspension." By executing this Contract, the Engineer certifies that it is not currently debarred, suspended, or otherwise excluded from or ineligible for participation in Federal Assistance Programs under Executive Order 12549. The parties to this contract shall require any party to a subcontract or purchase order awarded under this contract to certify its eligibility to receive Federal funds and, when requested by the Executive Director, to furnish a copy of the certification.

ARTICLE 35. PERTINENT NON-DISCRIMINATION AUTHORITIES

During the performance of this contract, the Engineer, for itself, its assignees, and successors in interest agree to comply with the following nondiscrimination statutes and authorities; including but not limited to:

- A.** Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq., 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21.
- B.** The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects).
- C.** Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 et seq.), as amended, (prohibits discrimination on the basis of sex).
- D.** Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 et seq.) as amended, (prohibits discrimination on the basis of disability); and 49 CFR Part 27.
- E.** The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 et seq.), (prohibits discrimination on the basis of age).
- F.** Airport and Airway Improvement Act of 1982, (49 U.S.C. Chapter 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex).
- G.** The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, subrecipients and contractors, whether such programs or activities are Federally funded or not).
- H.** Titles II and III of the Americans with Disabilities Act, which prohibits discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131-12189) as implemented by Department of Transportation regulations at 49 C.F.R. parts 37 and 38.

I. The Federal Aviation Administration’s Nondiscrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex).

J. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures nondiscrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations.

K. Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, the parties must take reasonable steps to ensure that LEP persons have meaningful access to the programs (70 Fed. Reg. at 74087 to 74100).

L. Title IX of the Education Amendments of 1972, as amended, which prohibits the parties from discriminating because of sex in education programs or activities (20 U.S.C. 1681 et seq.).

ARTICLE 36. BOYCOTT ISRAEL

The Contractor represents and warrants that (1) it does not, and shall not for the duration of this Contract, boycott Israel or (2) the verification required by Section 2271.002 of the Texas Government Code does not apply to this Contract.

ARTICLE 37. FIREARM ENTITIES AND TRADE ASSOCIATIONS DISCRIMINATION

The Engineer verifies that:

1. It does not, and will not for the duration of this Contract, have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; or
2. The verification required by Section 2274.002 of the Texas Government Code does not apply to the contract.

If circumstances relevant to this provision change during the course of this Contract, Engineer shall promptly notify the Executive Director.

ARTICLE 38. ENERGY COMPANY BOYCOTT

The Engineer verifies that:

1. It does not, and will not for the duration of the contract, boycott energy companies; or
2. The verification required by Section 2274.002 of the Texas Government Code does not apply to the contract.

If circumstances relevant to this provision change during the course of this Contract, the Engineer shall promptly notify the Executive Director.

ARTICLE 39. ABBREVIATIONS AND DEFINITIONS

Acts and Regulations	Federal, state, and local acts and regulations which are applicable to the Contract
Agreement	This Contract
Mobility Authority	The Central Texas Regional Mobility Authority
Business Days	Any day the Mobility Authority is open for business
CFR	Code of Federal Regulations
Contract	This contract document and its attachments
Days	Calendar days
DBE	Disadvantaged Business Enterprise
Engineer	The service provider performing the services under this Contract
Executive Director	The Executive Director of the Mobility Authority, or anyone to whom he has delegated the authority to act on his behalf

FAR	Federal Acquisition Regulations
FHWA	Federal Highway Administration
GEC	General Engineering Consultant
HUB	Historically Underutilized Business
OMB	Office of Management and Budget
Project	Any capital improvement, rehabilitation, repair, maintenance, or other work in conjunction with the Authority's or a partner's facilities.
PS&E	Plans, specifications, and estimate
Services	Any work assigned under this contract
TxDOT	Texas Department of Transportation
USDOT	United States Department of Transportation
Work Authorization	Any work authorization arising from this Contract
Year	When not otherwise clarified, "year" refers to a 12-month period

ATTACHMENT B
SERVICES TO BE PROVIDED BY THE MOBILITY AUTHORITY

The Mobility Authority shall perform and provide the following in a timely manner so as not to delay the Services to be provided by the Engineer:

1. Authorize the Engineer in writing to proceed.
2. Designate in writing a person to act as the Mobility Authority's representative, such person to have complete authority to transmit instructions, receive information, and interpret and define Authority's decisions with respect to the Services to be provided by the Engineer.
3. Render reviews, decisions and approvals as promptly as necessary to allow for the expeditious performance of the Services to be provided by the Engineer.
4. Provide timely review and decisions in response to the Engineer's request for information and/or required submittals and deliverables.
5. Maintain the Project's website and other public involvement materials.
6. Provide the Engineer with relevant data available to the Mobility Authority related to people, agencies and organizations interested in the project.
7. Either provide directly or have its designated General Engineering Consultant (GEC) provide general oversight services of the Engineer.
8. Provide for inspections of tolling equipment (including ITS elements and lightning protection).
9. Place at Engineer's disposal all reasonably available information pertinent to the Project.
10. Coordinate with utility companies for relocation efforts and any agreements needed for such.
11. Provide existing or updated utility information.
12. Provide assistance in coordinating with the Contractor, Corps of Engineers, FEMA, Travis County, City of Austin, and TxDOT for any approvals and permits required.
13. Address problems regarding any refusal to grant right of entry (ROE) or communication with landowners who are hostile with respect to the completion of this scope of services.

ATTACHMENT C SERVICES TO BE PROVIDED BY THE ENGINEER

The Engineer will be required to provide professional services including providing and maintaining qualified construction engineering, inspection, materials testing and survey quality assurance staff availability to oversee, review and document construction activities performed by a contractor separately selected by the Mobility Authority for the assigned project (Contractor). The general elements of work that will be required by the Mobility Authority are shown below.

1. Project Controls

The Engineer shall provide Project correspondence, Record keeper duties, Document control, project scheduling, Contractor draw requests, changes/assessment, Project reporting, and external auditing interface.

2. Construction Engineering

The Engineer will provide quality control and assurance for the construction of the project through construction engineering and management in accordance with the plans, specifications, and approved Construction Quality Management Plan to be developed by the Engineer in collaboration with the Mobility Authority.

3. Construction Inspections

The Engineer's inspection team shall perform and report construction inspections of all operations related to structures, roadway, drainage, traffic (i.e. signs, striping, signals, illumination, ITS), stormwater pollution prevention plan and traffic control to validate that the Contractor's work, including sequencing of work, is conducted in accordance with the approved contract documents.

4. Survey Oversight

Survey oversight is primarily intended as survey quality assurance of the efforts of the Contractor and the Contractor's surveyor.

5. Materials Engineering and Acceptance

Provide a Qualification Program for materials utilized for the construction of the Project in accordance with the Authority's Quality Acceptance Program ("QAP"). Maintain documentation of all qualified individuals who perform required tests for acceptance of materials.

ATTACHMENT D
NOT APPLICABLE

**ATTACHMENT E
FEE SCHEDULE
(Final Cost Proposal)**

This attachment provides the basis of payment and fee schedule. **The basis of payment for this contract is indicated by an “X” in the applicable box.** The basis shall be supported by the Final Cost Proposal (FCP) shown below. If more than one basis of payment is used, each one must be supported by a separate FCP.

“X”	Basis	
<input type="checkbox"/>	Lump Sum	<p>The lump sum shall be equal to the maximum amount payable. The lump sum includes all direct and indirect costs and profit. For payment the Engineer is not required to provide evidence of actual hours worked, travel, overhead rates or other evidence of cost, but must submit billing information in a form acceptable to the Mobility Authority as required by Article 4 A & B including classifying work, partial or completed, according to the Table of Deliverables.</p> <p>The Mobility Authority will agree to pay Engineer, and the Engineer will agree to accept as full and sufficient compensation and reimbursement for the performance of all Services as set forth in this Contract and the Work Authorization, a Lump Sum amount for the specified category of services.</p> <p>The Lump Sum will include compensation for Engineer's services and services of subconsultants, if any. Appropriate amounts will be incorporated in the Lump Sum to account for labor, overhead, profit, and reimbursable expenses.</p> <p>The portion of the Lump Sum amount billed for Engineer's Services will be based upon Engineer's estimate, as approved by the Mobility Authority's Director of Engineering, of the proportion of the total Services completed during the billing period to the Lump Sum amount.</p>

<input checked="" type="checkbox"/>	<p>Unit Cost</p>	<p>The unit cost(s) for each type of unit and number of units are shown in the FCP. The unit cost includes all direct and indirect costs and profit. For payment, the Engineer is not required to provide evidence of actual hours worked, travel, overhead rates or any other cost data. The FCP may include special items, such as equipment which are not included in the unit costs. Documentation of these special costs may be required. The maximum amount payable equals the total of all units times their respective unit cost plus any special direct items shown.</p> <p>The Mobility Authority will agree to pay the Engineer, and the Engineer will agree to accept as full and sufficient compensation and reimbursement for the performance of all Services as set forth in this Contract and the Work Authorization, an agreed upon unit price multiplied by the number of units completed for each billing.</p> <p>Each invoice submitted shall identify the specific Contract task(s) and completed work product/deliverable for the agreed upon price outlined in the Work Authorization.</p>
<input checked="" type="checkbox"/>	<p>Specified Rate Basis</p>	<p>The specified rates for each type of labor are shown in the FCP below. The FCP may include special items, such as equipment which are not included in the specified rates. The specified rate includes direct labor and indirect cost and profit. The Mobility Authority may request documentation of reimbursable direct costs including hours worked. Documentation of special item costs may be required. The specified rate is not subject to audit. Revisions to the specified rates may be proposed no more frequently than once per calendar year, and no sooner than 12 months after the Effective Date and are subject to written approval of the Executive Director.</p> <p>The Mobility Authority will agree to pay the Engineer, and the Engineer will agree to accept as full and sufficient compensation and reimbursement for the performance of all Services as set forth in this Contract and the Work Authorization, an amount equal to the cumulative hours charged to the specific Project by each class of Engineer's employees multiplied by the Standard Hourly Rates for each applicable billing class for all Services performed on the specific Project, plus reimbursable expenses and sub consultant's charges, if any.</p>
<input type="checkbox"/>	<p>Cost Plus</p>	<p>The Mobility Authority will agree to pay, and the Engineer will agree to accept as full and sufficient compensation and reimbursement for the performance of all Services as set forth in this Contract and the Work Authorization, hourly rates for the staff working on the assignment computed as follows:</p> <p><i>Direct Labor Cost x (1.0 + Overhead Rate) x (1.0 + Profit %, in decimal form).</i></p> <p>The invoice must itemize labor rates, hours worked, other direct costs and indirect costs. The Engineer may be required to provide documentation of hours worked and any eligible direct costs claimed. The provisional overhead rate charged is subject to audit and adjustment to actual rates incurred. The FCP below shows the hourly rates for labor, other direct expenses including but not limited to travel and allowable materials, and provisional overhead rate. Actual wages must be within the allowable range shown on the Final Cost Proposal.</p>

Without prior approval by the Executive Director, the Mobility Authority shall not reimburse the Engineer for expenses associated with relocating personnel to complete the services described by this Contract. Roadway tolls incurred by the Engineer or any of its subconsultants in connection with performance of the Services will not be reimbursable under this Contract. Reimbursement shall be limited to the terms of any financial assistance or Project agreements with TxDOT or other third parties. Travel expenses will be limited to the rates published by the Texas Comptroller of Public Accounts.

Engineer acknowledges that all expenses and costs paid or reimbursed by the Mobility Authority using federal or state funds shall be paid or reimbursed in accordance with, and subject to, applicable policies of the Mobility Authority and other applicable state and federal laws, including the applicable requirements of OMB Circular A-87, which may reduce the amount of expenses and costs reimbursed to less than what was incurred.

ATTACHMENT E – FEE SCHEDULE

Final Cost Proposal (FCP) Supporting Basis of Payment

* The **MAXIMUM AMOUNT PAYABLE** is \$3,000,000.00.

The maximum amount payable is based on the following data and calculations:

* The maximum amount payable must be based on the contract scope. The work authorization fee schedules will be derived from this attachment.

ATTACHMENT E - FEE SCHEDULE

CONTRACT NO. 23CEI2270XE

ATTACHMENT E - FEE SCHEDULE									
SPECIFIED RATE PAYMENT BASIS									
PRIME PROVIDER NAME:				BGE, Inc.					
Job Title	Years of Experience	Certifications	Hourly Base Rate	Hourly Contract Rate 2023		Hourly Contract Rate 2024		Hourly Contract Rate 2025	
				Office	Field	Office	Field	Office	Field
Project Manager	10+	PE	\$ 110.00	\$ 356.10	\$ 312.97	\$ 370.35	\$ 325.49	\$ 385.16	\$ 338.50
Engineer (Project) - Senior	10+	PE	\$ 80.00	\$ 258.98	\$ 227.61	\$ 269.34	\$ 236.72	\$ 280.12	\$ 246.19
Engineer (Project)	5 to 10	PE	\$ 60.00	\$ 194.24	\$ 170.71	\$ 202.01	\$ 177.54	\$ 210.09	\$ 184.64
Engineer-In-Training II	2 to 5		\$ 40.00	\$ 129.49	\$ 113.81	\$ 134.67	\$ 118.36	\$ 140.06	\$ 123.09
Engineer-In-Training I	0 to 2		\$ 33.00	\$ 106.83	\$ 93.89	\$ 111.10	\$ 97.65	\$ 115.55	\$ 101.55
Construction Superintendent	15+		\$ 56.00	\$ 181.29	\$ 159.33	\$ 188.54	\$ 165.70	\$ 196.08	\$ 172.33
Construction Inspector III	10 to 15		\$ 46.00	\$ 148.92	\$ 130.88	\$ 154.87	\$ 136.11	\$ 161.07	\$ 141.56
Construction Inspector II	5 to 10		\$ 38.00	\$ 123.02	\$ 108.12	\$ 127.94	\$ 112.44	\$ 133.06	\$ 116.94
Construction Inspector I	0 to 5		\$ 33.00	\$ 106.83	\$ 93.89	\$ 111.10	\$ 97.65	\$ 115.55	\$ 101.55
Records Keeper - Senior	10+		\$ 55.00	\$ 178.05	\$ 156.48	\$ 185.17	\$ 162.74	\$ 192.58	\$ 169.25
Records Keeper	0 to 10		\$ 36.00	\$ 116.54	\$ 102.43	\$ 121.20	\$ 106.52	\$ 126.05	\$ 110.78
Surveyor (RPLS)	15+	RPLS	\$ 56.00	\$ 181.29	\$ 159.33	\$ 188.54	\$ 165.70	\$ 196.08	\$ 172.33
Survey Technician (Surveyor-In-Training)	5 to 10		\$ 36.50	\$ 118.16	\$ 103.85	\$ 122.89	\$ 108.00	\$ 127.80	\$ 112.32
Survey Technician	0 to 5		\$ 23.00	\$ 74.46	\$ 65.44	\$ 77.44	\$ 68.06	\$ 80.53	\$ 70.78
Administrative/Clerical	N/A		\$ 35.00	\$ 113.31	\$ 99.58	\$ 117.84	\$ 103.56	\$ 122.55	\$ 107.71
				\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
INDIRECT COST RATE (OFFICE):			194.30%						
INDIRECT COST RATE (FIELD):			158.65%						
PROFIT RATE:			10.00%						

ATTACHMENT E - FEE SCHEDULE									
SPECIFIED RATE PAYMENT BASIS									
SUBPROVIDER NAME:				B2Z Engineering, LLC					
Job Title	Years of Experience	Certifications	Hourly Base Rate	Hourly Contract Rate 2023		Hourly Contract Rate 2024		Hourly Contract Rate 2025	
				Office	Field	Office	Field	Office	Field
Senior Materials Manager	10+	PE	\$ 110.00	\$ 295.58	\$ 295.58	\$ 307.40	\$ 307.40	\$ 319.70	\$ 319.70
Project Manager	10+	PE	\$ 95.00	\$ 255.27	\$ 255.27	\$ 265.48	\$ 265.48	\$ 276.10	\$ 276.10
Laboratory Manager	10+		\$ 70.00	\$ 188.10	\$ 188.10	\$ 195.62	\$ 195.62	\$ 203.44	\$ 203.44
Administrative/Clerical	N/A		\$ 35.00	\$ 94.05	\$ 94.05	\$ 97.81	\$ 97.81	\$ 101.72	\$ 101.72
Senior Technician	15+	ACI/TxAPA Accreditation	\$ 50.00	\$ 134.35	\$ 134.35	\$ 139.73	\$ 139.73	\$ 145.32	\$ 145.32
Technician	5 to 15	ACI/TxAPA Accreditation	\$ 44.00	\$ 118.23	\$ 118.23	\$ 122.96	\$ 122.96	\$ 127.88	\$ 127.88
Field Inspector	2 to 5		\$ 46.00	\$ 123.61	\$ 123.61	\$ 128.55	\$ 128.55	\$ 133.69	\$ 133.69
				\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
				\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
				\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
				\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
				\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
				\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
				\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
				\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
				\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
INDIRECT COST RATE (OFFICE):			144.28%						
INDIRECT COST RATE (FIELD):			144.28%						
PROFIT RATE:			10.00%						

ATTACHMENT E - FEE SCHEDULE									
SPECIFIED RATE PAYMENT BASIS									
SUBPROVIDER NAME:				McGray & McGray Land Surveyors, Inc.					
Job Title	Years of Experience	Certifications	Hourly Base Rate	Hourly Contract Rate 2023		Hourly Contract Rate 2024		Hourly Contract Rate 2025	
				Office	Field	Office	Field	Office	Field
Principal	15+	RPLS	\$ 86.25	\$ 210.35	\$ 210.35	\$ 218.76	\$ 218.76	\$ 227.51	\$ 227.51
Project Manager	10+	RPLS	\$ 71.87	\$ 175.28	\$ 175.28	\$ 182.29	\$ 182.29	\$ 189.58	\$ 189.58
Senior Survey Technician	5 to 10		\$ 43.55	\$ 106.21	\$ 106.21	\$ 110.46	\$ 110.46	\$ 114.88	\$ 114.88
Survey Technician	0 to 5		\$ 41.42	\$ 101.02	\$ 101.02	\$ 105.06	\$ 105.06	\$ 109.26	\$ 109.26
Senior RPLS	15+	RPLS	\$ 62.50	\$ 152.43	\$ 152.43	\$ 158.52	\$ 158.52	\$ 164.86	\$ 164.86
RPLS	10 to 15	RPLS	\$ 57.51	\$ 140.26	\$ 140.26	\$ 145.87	\$ 145.87	\$ 151.70	\$ 151.70
Administrative	N/A		\$ 32.49	\$ 79.24	\$ 79.24	\$ 82.41	\$ 82.41	\$ 85.70	\$ 85.70
Researcher	N/A		\$ 33.86	\$ 82.58	\$ 82.58	\$ 85.88	\$ 85.88	\$ 89.32	\$ 89.32
Lidar Technician	5 to 10		\$ 44.45	\$ 108.41	\$ 108.41	\$ 112.74	\$ 112.74	\$ 117.25	\$ 117.25
Field Coordinator	5 to 10		\$ 39.11	\$ 95.38	\$ 95.38	\$ 99.20	\$ 99.20	\$ 103.17	\$ 103.17
				\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
				\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
				\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
				\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
				\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
INDIRECT COST RATE (OFFICE):			121.71%						
INDIRECT COST RATE (FIELD):			121.71%						
PROFIT RATE:			10.00%						

ATTACHMENT E- FEE SCHEDULE

CONTRACT NO. 23CEI2270XE

Unit Costs - Material Testing			Consultant Proposal
Services To Be Provided	Test Code	Unit	Cost
Preparing Soil and Flexible Base Materials for Testing	Tex-101-E	each	\$ 85.00
Determining Moisture Content in Soil Materials	Tex-103-E	each	\$ 20.00
Determining Liquid Limits of Soils	Tex-104-E	each	\$ 50.00
Determining Plastic Soil Limits	Tex-106-E	each	\$ 50.00
Determining the Bar Linear Shrinkage of Soils	Tex-107-E	each	\$ 40.00
Determining the Specific Gravity of Soils	Tex-108-E	each	\$ 75.00
Particle Size Analysis of Soils	Tex-110-E	each	\$ 215.00
Determining the Amount of Material in Soils Finer than the 75 micrometer (No. 200) Sieve	Tex-111-E	each	\$ 75.00
Admixing Lime to Reduce Plasticity Index of Soils	Tex-112-E	each	\$ 200.00
Laboratory Compaction Characteristics and Moisture-Density Relationship of Base Materials	Tex-113-E	each	\$ 310.00
Laboratory Compaction Characteristics and Moisture-Density Relationship of Subgrade, Embankment Soils, and Backfill Material	Tex-114-E	each	\$ 300.00
Ball Mill Method for Determining the Disintegration of Flexible Base Material	Tex-116-E	each	\$ 250.00
Triaxial Compression Test for Disturbed Soils and Base Materials	Tex-117-E	each	\$ 2300.00
Triaxial Compression Test for Undisturbed Soils	Tex-118-E	each	\$ 475.00
Soil-Cement Testing- Part 1	Tex-120-E	each	\$ 550.00
Soil-Cement Testing- Part 2	Tex-120-E	each	\$ 400.00
Soil-Lime Testing- Part 1	Tex-121-E	each	\$ 450.00
Soil-Lime Testing- Part 2	Tex-121-E	each	\$ 400.00
Soil-Lime Testing- Part 3	Tex-121-E	each	\$ 400.00
Molding, Testing, and Evaluating Bituminous Black Base Materials	Tex-126-E	each	\$ 2250.00
Lime Fly-Ash Compressive Strength Test Methods- Part 1	Tex-127-E	each	\$ 125.00
Lime Fly-Ash Compressive Strength Test Methods- Part 2	Tex-127-E	each	\$ 125.00
Determining Soil pH	Tex-128-E	each	\$ 70.00
Measuring the Resistivity of Soil Materials	Tex-129-E	each	\$ 125.00
Slurry Testing	Tex-130-E	each	\$ 35.00
Laboratory Classification of Soils for Engineering Purposes	Tex-142-E	each	\$ 65.00
Determining Sulfate Content in Soils - Colorimetric Method	Tex-145-E	each	\$ 120.00
Conductivity Test for Field Detection of Sulfates in Soil	Tex-146-E	each	\$ 125.00
Soil Organic Content Using UV-Vis Method	Tex-148-E	each	\$ 450.00
Sieve Analysis of Fine and Coarse Aggregate	Tex-200-F	each	\$ 120.00
Bulk Specific Gravity and Water Absorption of Aggregate	Tex-201-F	each	\$ 100.00
Apparent Specific Gravity of Material Finer than No. 50 Sieve	Tex-202-F	each	\$ 100.00
Sand Equivalent	Tex-203-F	each	\$ 140.00
Laboratory Method of Mixing Bituminous Mixtures	Tex-205-F	set of 3	\$ 145.00
Compacting Specimens Using the Texas Gyrotory Compactor (TGC)	Tex-206-F	set of 3	\$ 105.00
Bulk Specific Gravity of Compacted Bituminous Mixtures	Tex-207-F (Part I)	each	\$ 90.00
Determining Mat Segregation Using a Density-Testing Gauge	Tex-207-F (Part V)	each	\$ 120.00
Bulk Specific Gravity of Compacted Bituminous Mixtures (Vacuum Method)	Tex-207-F (Part VI)	each	\$ 85.00
Determining Longitudinal Joint Density Using a Density Testing Gauge	Tex-207-F (Part VII)	each	\$ 85.00
Determining Density of Permeable Friction Course (PFC) Mixtures	Tex-207-F (Part VIII)	each	\$ 90.00
Test of Stabilometer Value of Bituminous Mixtures	Tex-208-F	set of 3	\$ 125.00
Determining Asphalt Content of Bituminous by Extraction	Tex-210-F	each	\$ 250.00
Determining Moisture Content of Bituminous Mixtures	Tex-212-F	each	\$ 45.00
Determining Deleterious Material and Decantation Test for Coarse Aggregates	Tex-217-F	each	\$ 100.00
Sampling Aggregate for Bituminous Mixtures, Surface Treatments and Limestone	Tex-221-F	each	\$ 50.00
Determining Flakiness Index	Tex-224-F	each	\$ 100.00
Indirect Tensile Strength Test	Tex-226-F	set of 3	\$ 350.00
Theoretical Maximum Specific Gravity of Bituminous Mixtures	Tex-227-F	each	\$ 115.00
Combined Bituminous Mixture Cold-Belt Sampling and Testing Procedure	Tex-229-F	each	\$ 120.00
Determining Asphalt Content of Bituminous by Ignition	Tex-236-F	each	\$ 180.00
Superpave Gyrotory Compacting of Test Specimens of Bituminous Mixtures	Tex-241-F	set of 2	\$ 175.00
Hamburg Wheel-Tracking Test	Tex-242-F	each	\$ 700.00
Tack Coat Adhesion	Tex-243-F	each	\$ 250.00
Thermal Profile of Hot Mix Asphalt	Tex-244-F	each	\$ 200.00
Permeability or Water Flow of Hot Mix Asphalt	Tex-246-F	each	\$ 100.00
Determining Flat and Elongated Particles	Tex-280-F	each	\$ 150.00
Compressive Strength of Cement Mortars	ASTM C109	set of 3	\$ 80.00
Sieve Analysis of Fine and Coarse Aggregate	Tex-401-A	each	\$ 90.00
Fineness Modulus of Fine Aggregate	Tex-402-A	each	\$ 90.00
Saturated Surface-Dry Specific Gravity and Absorption of Aggregates	Tex-403-A	each	\$ 85.00
Determining Unit Mass (Weight) of Aggregates	Tex-404-A	each	\$ 75.00
Determining Percent Voids and Solids in Concrete	Tex-405-A	each	\$ 65.00
Material Finer than 75 micrometer (No. 200) Sieve in Mineral Aggregates	Tex-406-A	each	\$ 80.00
Organic Impurities in Fine Aggregate for Concrete	Tex-408-A	each	\$ 80.00
Free Moisture and Water Absorption in Aggregate for Concrete	Tex-409-A	each	\$ 80.00
Abrasion of Coarse Aggregate Using the Los Angeles Machine	Tex-410-A	each	\$ 320.00
Soundness of Aggregate Using Sodium Sulfate or Magnesium Sulfate	Tex-411-A	each	\$ 385.00
Determining Deleterious Material In Mineral Aggregate	Tex-413-A	each	\$ 100.00
Unit Weight Yield, and Air Content (Gravimetric) of Concrete	Tex-417-A	each	\$ 75.00
Compressive Strength of Cylindrical Concrete Specimens	Tex-418-A	each	\$ 30.00
Obtaining and Testing Drilled Cores of Concrete	Tex-424-A	each	\$ 200.00
Absorption and Dry Bulk Specific Gravity of Lightweight Coarse Aggregate	Tex-433-A	each	\$ 100.00
Measuring Texture Depth by the Sand Patch Method	Tex-436-A	each	\$ 100.00
Test Flow of Grout Mixtures (Flow Cone Method)	Tex-437-A	each	\$ 95.00
Flexural Strength of Concrete Using Simple Beam Third-Point Loading	Tex-448-A	each	\$ 100.00
Capping Cylindrical Concrete Specimens	Tex-450-A	each	\$ 30.00
Determining Crushed Face Particle Count	Tex-460-A	each	\$ 100.00

Unit Costs - Surveying		Consultant Proposal
Services To Be Provided	Unit	Cost
1 - Person Survey Crew	hour	\$ 105.00
2 - Person Survey Crew	hour	\$ 160.00
3 - Person Survey Crew	hour	\$ 190.00
4 Person Field Crew	hour	\$ 240.00
RTK Field Crew + Rover	hour	\$ 305.00
Terrestrial Lidar Unit	hour	\$ 100.00
Mobile Mapping Unit (per day)	day	\$ 8,550.00
UAV Lidar Unit (per day)	day	\$ 3,675.00
Additional Vehicle (per day)	day	\$ 100.00
ATV (per day)	day	\$ 85.00

Other Direct Expenses		Consultant Proposal
	Unit	ODE Rate
Mileage	mile	IRS Rate
Construction Truck (Includes operation, and maintenance costs; Insurance costs will not be reimbursed)	month	\$ 1,500.00
Construction Truck (Includes operation, and maintenance costs; Insurance costs will not be reimbursed)	day	\$ 150.00
Cylinder Molds	each	\$ 3.00
Nuclear Gauge	Trip	\$ 75.00

**ATTACHMENT F
WORK SCHEDULE**

See issued Work Authorizations for Work Schedule.

ATTACHMENT G
COMPUTER GRAPHICS FOR DOCUMENT AND INFORMATION EXCHANGE

Not applicable.

**ATTACHMENT H
SUBCONTRACTING**

The Mobility Authority has established the DBE/HUB participation goal of 3.5% for this Agreement, however the Mobility Authority will review and adjust the goal for each work authorization based on specific project assignments.

Exhibit B

IEA, Inc.

**CONTRACT FOR PROFESSIONAL SERVICES
Specific Deliverable with Work Authorizations**

THIS CONTRACT FOR ENGINEERING SERVICES is made by and between the Central Texas Regional Mobility Authority, 3300 N Interstate 35 Frontage Rd #300, Austin, Texas 78705, hereinafter called "Mobility Authority," and **IEA Inc.**, having its principal business address at **18383 Preston Road, Suite 500, Dallas, TX 75252**, hereinafter called "Engineer," for the purpose of contracting for engineering services.

WITNESSETH

WHEREAS, the Mobility Authority desires to contract for services generally described as professional engineering services, and more specifically described in Article 1; and

WHEREAS, pursuant to a qualifications-based selection conducted in accordance with the Professional Services Procurement Act (Tex. Gov't Code Sec. 2254.001, et. seq.), and the Mobility Authority's Policy Code regarding the procurement of professional services, the Mobility Authority has selected the Engineer to provide the needed Services; and

WHEREAS, the Engineer has agreed to provide the Services subject to the terms and conditions hereinafter set forth.

NOW, THEREFORE, the Mobility Authority and the Engineer, in consideration of the mutual covenants and agreements herein contained, do hereby mutually agree as follows.

AGREEMENT

ARTICLE 1. SCOPE OF SERVICES. The Mobility Authority and the Engineer will furnish items and perform those services for fulfillment of this Contract as identified in Attachment B, Services to be Provided by the Mobility Authority and Attachment C, Services to be Provided by the Engineer. All services provided by the Engineer will conform to standard engineering practices and applicable rules and regulations of the Texas Engineering Practices Act and the rules of the Texas Board of Professional Engineers and Land Surveyors. This Contract does not obligate the Mobility Authority to proceed with the Services or authorize the performance of work through a Work Authorization.

ARTICLE 2. CONTRACT PERIOD. This Contract becomes effective when fully executed by all parties hereto and it shall terminate at the close of business on **December 1, 2025** (the "Contract Period") unless the Contract Period is: (1) modified by written supplemental agreement prior to the date of termination as set forth in Attachment A, General Provisions, Article 6, Supplemental Agreements; (2) extended due to a work suspension as provided for in Attachment A, Article 3, Paragraph C; or (3) otherwise terminated in accordance with Attachment A, General Provisions, Article 15, Termination. A Work Authorization issued prior to expiration of this Contract may remain in effect until such time as the Services authorized under that Work Authorization are complete and accepted by the Mobility Authority. The terms of this Contract shall continue in effect in respect to any work authorization remaining in effect following the expiration of this Contract. No new Services may be added to a Work Authorization, and no new Work Authorization may be issued after the termination date of this Contract.

ARTICLE 3. COMPENSATION.

A. Maximum Amount Payable. The maximum amount payable under this Contract without modification is shown in Attachment E, Fee Schedule.

B. Basis of Payment. The basis of payment is identified in Attachment E, Fee Schedule. Reimbursement of costs incurred under a work authorization shall be in accordance with Attachment E, Fee Schedule. The amount presented in Attachment E is the amount the Mobility Authority will agree to pay, and the Engineer will agree to accept as full and sufficient compensation and reimbursement, for the performance of all services as set forth in this Contract and work authorizations.

C. Reimbursement of Eligible Costs. To be eligible for reimbursement, the Engineer's costs must (1) be incurred in accordance with the terms of a valid work authorization; (2) be in accordance with Attachment E, Fee Schedule; and (3) comply with cost principles set forth at 48 CFR Part 31, Federal Acquisition Regulation (FAR 31). Satisfactory progress of work shall be maintained as a condition of payment.

D. Engineer Payment of Subconsultants. No later than ten (10) days after receiving payment from the Mobility Authority, the Engineer shall pay all subconsultants for work performed under a subcontract authorized hereunder. The Mobility Authority may withhold all payments that have or may become due if the Engineer fails to comply with the ten-day payment requirement. The Mobility Authority may also suspend the work under this Contract or any work authorization until subconsultants are paid. This requirement also applies to all lower tier subconsultants, and this provision must be incorporated into all subcontracts.

E. Non-compensable Time. Time spent by the Engineer's personnel or subconsultants in an administrative or supervisory capacity not related to the performance of the Services is not compensable and shall not be billed to the Mobility Authority. Time spent on work in excess of what would reasonably be considered appropriate under industry standards for the performance of such Services is not compensable, unless that additional time spent resulted from the Mobility Authority's delay in providing information, materials, feedback, or other necessary cooperation to the Engineer. The Mobility Authority will not pay any hourly compensation to the Engineer for Services or deliverables required due to an error, omission, or fault of the Engineer.

F. Consistency of Classification/Duties and Hourly Rates. Time spent by the Engineer's personnel or subconsultants to perform services or functions capable of being carried out by other, subordinate personnel with a lower hourly rate shall be billed at a rate equivalent to that of the applicable qualified subordinate personnel.

G. Taxes. All payments to be made by the Mobility Authority to the Engineer pursuant to this Contract are inclusive of federal, state, or other taxes, if any, however designated, levied, or based. The Mobility Authority acknowledges and represents that it is a tax-exempt entity under Sections 151.309, et seq., of the Texas Tax Code. A "Texas Sales and Use Tax Exemption Certificate" is available from the Mobility Authority for use toward project-related expenses upon request. Title to any consumable items purchased by the Engineer in performing this Contract shall be deemed to have passed to the Mobility Authority at the time the Engineer takes possession or earlier, and such consumable items shall immediately be marked, labeled, or physically identified as the property of the Mobility Authority, to the extent practicable.

ARTICLE 4. INVOICE REQUIREMENTS

A. Monthly Invoices. The Engineer shall request reimbursement of costs incurred by submitting an itemized invoice in a form acceptable to the Mobility Authority. If the work is eligible for payment through an agreement with another entity, the billing statement shall be in a form and include such detail as that entity may require, including a breakdown of Services provided on a Project-by-Project basis, together with other Services requested by the Mobility Authority. The Engineer is authorized to submit requests for reimbursement no more frequently than monthly and no later than ninety (90) days after costs are incurred, with the exception of the closing of the Mobility Authority's fiscal year. Notwithstanding the ninety (90) day submittal deadline, all requests for reimbursement of costs incurred during the Mobility Authority's fiscal year (ending June 30th) must be submitted no later than 15 days after June 30th, or the next business day if that date should occur on a weekend or holiday.

B. Form of Invoice. The invoice shall show the work authorization number for each work authorization included in the billing, the total amount earned to the date of submission, and the amount due and payable as of the date of the current billing statement for each work authorization. The invoice shall indicate if the work has been completed or if the billing is for partial completion of the work. The fixed fee will be paid in proportion to the percentage of work completed per work authorization.

C. Overhead Rates. The Engineer shall use the provisional overhead rate indicated in Attachment E. If a periodic escalation of the provisional overhead rate is specified in Attachment E, the effective date of the revised provisional overhead rate must be included. For lump sum contracts, the overhead rate remains unchanged for the entire Contract Period.

D. Thirty Day Payments. Upon receipt of an invoice that complies with all invoice requirements set forth in this Article, the Mobility Authority shall make a good faith effort to pay the amount which is due and payable within thirty (30) days. If the Mobility Authority disputes a request for payment by the Engineer, the Mobility Authority agrees to pay any undisputed portion of the invoice within this 30-day window. The Mobility Authority shall notify the Engineer of the disputed amount no later than the 21st day after the date the Mobility Authority receives the monthly invoice.

E. Withholding Payments. The Mobility Authority reserves the right to withhold payment of up to 110% of the disputed amount of the Engineer's invoice in the event of any of the following: (1) If a dispute over the work or costs thereof is not resolved within a thirty day period; (2) pending verification of satisfactory work performed; or (3) required reports (including third-party verifications, if any) are not received. In the event that payment is withheld, the Mobility Authority shall notify the Engineer and give a remedy that would allow the Mobility Authority to release the payment.

F. Invoice and Progress Report Submittal Process.

(1) The invoice submittal shall include:

- Progress report
- Forecast for completion of the scope
- Invoice (in the required format provided by the Mobility Authority)
- Disadvantaged Business Enterprise (DBE)/Historically Underutilized Business (HUB) Forms, as required
- Supporting documents as requested

(2) A progress report shall be submitted to the Mobility Authority at least once each calendar month;

(3) An update to the Project schedule (using critical path method analysis) indicating the Project's overall status versus the baseline schedule (originally submitted with the Project Management Plan) shall be submitted to the Mobility Authority at least once each calendar month;

(4) In the event that invoices are not submitted on a monthly basis, a monthly submittal of the progress report and Project schedule information will be required nevertheless;

(5) The invoice submittal shall not be later than the 10th day of the month following service unless otherwise directed; if submitted after the 10th day, it will be processed the following month;

(6) As it relates to the Mobility Authority's end of fiscal year closeout efforts, the Engineer shall submit the invoice including their services through June 30th for a given year no later than 15 days after June 30th, or the next business day if that date should occur on a weekend or holiday;

(7) The Mobility Authority's Director of Engineering and/or the Mobility Authority's General Engineering Consultant (GEC) will review the invoices to confirm that supporting documentation is included, and for compliance with the Contract and consistency with the submitted progress report; and

(8) The invoice will either be recommended for approval by the Mobility Authority's Director of Engineering and/or GEC, or the Mobility Authority's Director of Engineering and/or GEC will return it to the Engineer for required correction.

G. Effect of Payments. No payment by the Mobility Authority shall relieve the Engineer of its obligation to perform on a timely basis the Services required under this Contract. If, prior to acceptance of any Service, product or other deliverable, the Executive Director determines that said Service, product or deliverable does not satisfy the requirements of this Contract, the Executive Director may reject same and require the Engineer to correct or cure same within a reasonable period of time and at no additional cost to the Mobility Authority.

H. Audit. The Mobility Authority shall have the right to examine the books and records of the Engineer. The Engineer shall maintain all books, documents, papers, accounting records and other evidence pertaining to cost incurred and shall make such materials available at its office during the Contract Period and for four (4) years from the date of final payment under this Contract or until any pending litigation has been completely and fully

resolved, and the Executive Director approves of the destruction of records, whichever occurs last. The Mobility Authority or any of its duly authorized representatives, TxDOT, Texas State Auditor, the Federal Highway Administration ("FHWA"), the United States Department of Transportation Office of Inspector General and the Comptroller General shall have access to any and all books, documents, papers and records of the Engineer which are directly pertinent to this Contract for the purpose of making audits, examinations, excerpts and transcriptions.

ARTICLE 5. WORK AUTHORIZATIONS. The Executive Director will issue work authorizations to authorize all work under this contract. Refusal to accept a work authorization in the form prescribed by the Mobility Authority may be grounds for termination of the contract. The Mobility Authority shall not be responsible for actions by the Engineer or any costs incurred by the Engineer relating to work not directly associated with or prior to the full execution of a work authorization. Terms and conditions governing the use of work authorizations are set forth in Attachment A, General Provisions, Article 1.

ARTICLE 6. SIGNATORY WARRANTY. The undersigned signatory for the Engineer hereby represents and warrants that he or she is an officer of the organization for which he or she has executed this Contract and that he or she has full and complete authority to enter into this Contract on behalf of the firm. These representations and warranties are made for the purpose of inducing the Mobility Authority to enter into this Contract.

ARTICLE 7. NOTICES. A notice, demand, request, report, and other communication required or permitted under this Contract, or which any party may desire to give, shall be in writing and shall be deemed to have been given on the sooner to occur of (i) receipt by the party to whom the notice is hand-delivered, with a written receipt of notice provided by the receiving party, or (ii) two days after deposit in a regularly maintained express mail receptacle of the United States Postal Service, postage prepaid, or registered or certified mail, return receipt requested, express mail delivery, addressed to such party at their address set forth below, or to such other address as a party may from time to time designate under this article, or (iii) receipt of an electronic mail transmission (attaching scanned documents in a format such as .pdf or .tif) for which confirmation of receipt by the other party has been obtained by the sending party:

<p>Engineer:</p> <p>Bobby A. Ramthun, P.E Senior Project Manager IEA, Inc. 13805 Research Blvd., Suite 812 Austin, TX 78750</p>	<p>Mobility Authority:</p> <p>Director of Engineering Central Texas Regional Mobility Authority 3300 N Interstate 35 Frontage Rd #300 Austin, Texas 78705</p>
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ARTICLE 8. INCORPORATION OF PROVISIONS. Attachments A through H are attached hereto and incorporated into this Contract as if fully set forth herein.

ARTICLE 9. ENTIRETY OF AGREEMENT. This writing, including attachments and addenda, if any, embodies the entire agreement and understanding between the parties hereto, and there are no agreements and understandings, oral or written, with reference to the subject matter hereof that are not merged herein and superseded hereby. No alteration, change or modification of the terms of the Contract shall be valid unless made in writing signed by both parties hereto.

ARTICLE 10. PRIORITY OF DOCUMENTS/ORDER OF PRECEDENCE. In the event of any conflict between the Contract and other documents, the order of precedence shall be as set forth below: A) Supplemental Work Authorization; B) Work Authorization; C) Contract Amendments; D) Contract; E) RFP/ RFQ; F) Engineer's Response to RFP/RFQ.

ARTICLE 11. ROLE OF THE GEC. The Mobility Authority will utilize a GEC to assist in its management of this Contract. The GEC is an independent contractor and is authorized by the Mobility Authority to provide the management and technical direction for this Contract on behalf of the Mobility Authority, provided that the GEC is not an agent of the Mobility Authority. All the technical and administrative provisions of the Contract may be

managed by the GEC, and the Engineer shall comply with all of the GEC’s directives that are within the purview of the Contract. Decisions concerning Contract amendments and adjustments, such as time extensions and Supplemental Work Authorizations, shall be made by the Executive Director, unless otherwise specified; however, requests for such amendments or adjustments may be made through the GEC, who shall forward such requests to the Executive Director with its comments and recommendations.

Should any dispute arise between the GEC and the Engineer, concerning the conduct of this Contract, either party may request a resolution of said dispute by the Executive Director, whose decision shall be final.

Each party is signing this agreement on the date stated under that party’s signature.

THE ENGINEER

**CENTRAL TEXAS REGIONAL MOBILITY
AUTHORITY**

(Signature)
Shakeel Ahmed

(Printed Name)
Principal

(Title)

(Date)

(Signature)
James M. Bass

(Printed Name)
Executive Director

(Title)

(Date)

**Attachments and Exhibits to Contract for Engineering Services
Incorporated into the Contract by Reference**

Attachments	Title
A	General Provisions
B	Services to Be Provided by the Mobility Authority
C	Services to Be Provided by the Engineer
D	Not Applicable
E	Fee Schedule
F	Work Schedule
G	Computer Graphics Files for Document and Information Exchange, if applicable
H	Subcontracting

ATTACHMENT A

GENERAL PROVISIONS

ARTICLE 1. WORK AUTHORIZATIONS

A. Use. The Engineer shall not begin any work until the Executive Director and the Engineer have signed a Work Authorization and the Engineer has received a Notice to Proceed as defined in the Work Authorization. Costs incurred by the Engineer before a Work Authorization is fully executed or after the completion date specified in the Work Authorization are not eligible for reimbursement. The Executive Director will issue Work Authorizations to authorize all work under this Contract. All work must be completed on or before the completion date specified in the Work Authorization.

B. Contents. Each Work Authorization shall include: (1) scope of Services including types of Services to be performed and a full description of the work required to perform those Services (2) a full description of general administration tasks exclusive to that Work Authorization (3) a work schedule (including beginning and ending dates) with milestones; (4) the basis of payment whether cost-plus, unit cost, lump sum, or specified rate; (5) a Work Authorization budget using fees set forth in Attachment E Fee, Schedule.; and (6) DBE/HUB Requirements. The Engineer shall not include additional contract terms and conditions in the Work Authorization. In the event of any conflicting terms and conditions between the Work Authorization and the contract, the terms and conditions of the contract shall prevail and govern the work and costs incurred.

C. Work Authorization Budget. A Work Authorization budget shall be prepared by the Engineer and set forth in detail (1) the computation of the estimated cost of the work as described in the Work Authorization, (2) the estimated time (hours/days) required to complete the work at the hourly rates established in Attachment E, Fee Schedule; (3) a work plan that includes a list of the work to be performed, (4) a stated maximum number of calendar days to complete the work, and (5) a cost-not-to-exceed-amount or unit or lump sum cost and the total cost or price of the Work Authorization. The Mobility Authority will not pay items of cost that are not included in or rates that exceed those approved in Attachment E.

D. No Guaranteed Work. Work Authorizations are issued at the sole discretion of the Executive Director. While it is the Executive Director's intent to issue Work Authorizations hereunder, the Engineer shall have no cause of action conditioned upon the lack or number of Work Authorizations issued.

E. Incorporation into Contract. Each Work Authorization shall be signed by both parties and become a part of the Contract. No Work Authorization will waive the Mobility Authority's or the Engineer's responsibilities and obligations established in this Contract. The Engineer shall promptly notify the Mobility Authority of any event that will affect completion of the Work Authorization.

F. Supplemental Work Authorizations. Before additional work may be performed or additional costs incurred beyond those authorized in a Work Authorization, a change in a Work Authorization shall be enacted by a written Supplemental Work Authorization executed within the period of performance specified in the Work Authorization. The Mobility Authority shall not be responsible for actions by the Engineer or any costs incurred by the Engineer relating to additional work not directly associated with the performance or prior to the execution of the Supplemental Work Authorization. The Engineer shall allow adequate time for review and approval of the Supplemental Work Authorization by the Executive Director prior to expiration of the Work Authorization. Any Supplemental Work Authorization must be executed by both parties within the Contract Period established in Article 2 of the Contract.

F-1. More Time Needed. If the Engineer determines or reasonably anticipates that the work authorized in a Work Authorization cannot be completed before the specified completion date, the Engineer shall promptly notify the Executive Director. The Executive Director may, at his sole discretion, extend the Work Authorization period by execution of a Supplemental Work Authorization.

F-2. Changes in Scope. Changes that would modify the scope of the work authorized in a Work Authorization must be enacted by a written Supplemental Work Authorization. If the change in scope affects the amount payable under the Work Authorization, the Engineer shall prepare a revised Work Authorization budget for the Executive Director's approval. The Engineer must allow adequate time for

the Executive Director to review, negotiate, and approve any request for a Supplemental Work Authorization prior to expiration of the Work Authorization.

G. Deliverables. Upon satisfactory completion of the Work Authorization, the Engineer shall submit a letter of completion along with the deliverables as specified in the executed Work Authorization to the Executive Director for review and acceptance.

ARTICLE 2. PROGRESS

A. Progress meetings. As required and detailed in the Work Authorizations or as otherwise directed by the Executive Director, the Engineer shall from time to time during the progress of the work confer with the Executive Director. The Engineer shall prepare and present such information as may be pertinent and necessary or as may be requested by the Executive Director in order to evaluate features of the work.

B. Conferences. At the request of the Executive Director and as required and detailed in the Work Authorizations, conferences shall be held at the Engineer's office, the office of the Mobility Authority, or at other locations designated by the Executive Director. These conferences may also include evaluation of the Engineer's Services and work when requested by the Executive Director.

C. Inspections. If federal funds are used to reimburse costs incurred under this contract, the work and all reimbursements will be subject to periodic review by the U. S. Department of Transportation.

D. Reports. The Engineer shall promptly advise the Executive Director in writing of events that have a significant impact upon the progress of a Work Authorization, including:

1. problems, delays, adverse conditions that will materially affect the ability to meet the time schedules and goals, or preclude the attainment of project work units by established time periods; this disclosure will be accompanied by statement of the action taken or contemplated, and any State or federal assistance needed to resolve the situation; and
2. favorable developments or events which enable meeting the work schedule goals sooner than anticipated.

E. Corrective Action. Should the Executive Director determine that the progress of work does not satisfy the work schedule or other deadlines set forth in a Work Authorization, the Executive Director shall review the work schedule with the Engineer to determine the nature of corrective action needed. The Executive Director's participation in reviewing the work schedule and determining corrective actions needed will not, in any way, excuse the Engineer from any responsibility or costs associated with the failure to timely perform the Services.

ARTICLE 3. SUSPENSION OF WORK AUTHORIZATION

A. Notice. Should the Executive Director desire to suspend a Work Authorization but not terminate the contract, the Executive Director may provide written notification to the Engineer, giving ten (10) business days prior notice. Both parties may waive the ten (10) business day notice requirement in writing.

B. Reinstatement. All or part of a Work Authorization may be reinstated and resumed in full force and effect within thirty (30) days of receipt of written notice from the Executive Director to resume the work. Both parties may waive the thirty-day notice in writing.

C. Contract Period Not Affected. If the Executive Director suspends a Work Authorization, the Contract Period as determined in Article 2 of the Contract is not affected and the contract and the Work Authorization will terminate on the date specified unless the contract is amended to authorize additional time.

D. Limitation of Liability. The Mobility Authority shall have no liability for work performed or costs incurred prior to the date authorized by the Executive Director to begin work, during periods when work is suspended, or after the completion of the contract or Work Authorization.

ARTICLE 4. ADDITIONAL WORK

A. Notice. If the Engineer is of the opinion that any assigned work is beyond the scope of a Work Authorization and constitutes additional work beyond the Services to be provided under the Work Authorization, it shall promptly notify the Executive Director and submit written justification presenting the facts of the work and demonstrating how the work constitutes supplementary work.

B. Supplemental Agreement. If the Executive Director finds that the work does constitute additional work, the Executive Director shall so advise the Engineer and a written supplemental agreement will be executed as provided in General Provisions, Article 6, Supplemental Agreements.

C. Limitation of Liability. The Mobility Authority shall not be responsible for actions by the Engineer or any costs incurred by the Engineer relating to additional work not directly associated with or prior to the execution of a supplemental agreement.

ARTICLE 5. CHANGES IN WORK

A. Work Previously Submitted as Satisfactory. If the Engineer has submitted work in accordance with the terms of this Contract and Work Authorization(s) but the Executive Director requests changes to the completed work or parts thereof which involve changes to the original scope of Services or character of work under the Contract and Work Authorization(s), the Engineer shall make such revisions as requested and as directed by the Executive Director, provided the work is reflected in a Supplemental Work Authorization.

B. Work Does Not Comply with Contract. If the Engineer submits work that does not comply with the terms of this Contract or Work Authorization(s), the Executive Director shall instruct the Engineer to make such revision as is necessary to bring the work into compliance with the Contract or Work Authorization(s). No additional compensation shall be paid for these revisions or re-work.

C. Errors/Omissions. The Engineer shall make revisions to the work authorized in this contract which are necessary to correct errors or omissions appearing therein, when required to do so by the Executive Director. No additional compensation shall be paid for this work.

ARTICLE 6. SUPPLEMENTAL AGREEMENTS

A. Need. The terms of this contract may be modified if the Executive Director determines that there has been a significant increase or decrease in the duration, scope, cost, complexity or character of the services to be performed. A supplemental agreement will be executed to authorize such significant increases or decreases.

B. When to Execute. Both the Engineer and the Executive Director must execute a supplemental agreement within the Contract Period specified in Article 2 of the Contract.

ARTICLE 7. DATA OWNERSHIP

A. Work for Hire. All services provided under this contract are considered work for hire and as such all data, basic sketches, charts, calculations, plans, specifications, and other documents created or collected under the terms of this contract are the property of the Mobility Authority.

B. Ownership of Plans. Notwithstanding any provision in this Contract or in common law or statute to the contrary all of the plans, tracings, estimates, specifications, computer records, discs, tapes, proposals, sketches, diagrams, charts, calculations, correspondence, memoranda, survey notes, and other data and materials, and any part thereof, created, compiled or to be compiled by or on behalf of the Engineer, including all information prepared for or posted on the Mobility Authority's website and together with all materials and data furnished to it by the Mobility Authority, are and at all times shall be and remain the property of the Mobility Authority and shall not be subject to any restriction or limitation on their further use by or on behalf of the Mobility Authority. Engineer hereby assigns any and all rights and interests it may have in the foregoing to the Mobility Authority, and Engineer hereby agrees to provide reasonable cooperation as may be requested by the Mobility Authority in connection with the Mobility Authority's efforts to perfect or protect rights and interests in the foregoing; and if at any time demand be made by the Mobility Authority for any of the above materials, records, and documents, whether after termination of this Contract or otherwise, such shall be turned over to the Mobility Authority without delay. The Mobility Authority hereby grants the Engineer a revocable license to retain and utilize the foregoing materials for the limited purpose of fulfilling Engineer's obligations under this Contract, said license to terminate and expire upon the earlier to occur of (a) the completion of Services described in this Contract or (b) the termination of this Contract, at which time the Engineer shall deliver to the Mobility Authority all such materials and documents. If the Engineer or a subconsultant desires later to use any of the data generated or obtained by it in connection with any Project or any other portion of the work product resulting from the Services, it shall secure the prior written approval of the Executive Director. The Engineer shall retain its copyright and ownership rights in its own back-office databases and computer software that are

not developed for the Mobility Authority or for purposes of this Contract. Intellectual property developed, utilized, or modified in the performance of Services for which the Engineer is compensated under the terms of this Contract shall remain the property of the Mobility Authority, Engineer hereby agrees to provide reasonable cooperation as may be requested by the Mobility Authority in connection with the Mobility Authority's efforts to perfect or protect such intellectual property. The Mobility Authority retains an unrestricted license for software packages developed in whole or in part with Mobility Authority funds.

C. Separate Assignment. If for any reason the agreement of the Mobility Authority and the Engineer set forth in subarticle 7.B regarding the ownership of work product and other materials is determined to be unenforceable, either in whole or in part, the Engineer hereby assigns and agrees to assign to the Mobility Authority all right, title, and interest that Engineer may have or at any time acquire in said work product and other materials, without royalty, fee or additional consideration of any sort, and without regard to whether this Contract has terminated or remains in force. The Mobility Authority hereby acknowledges, however, that all documents and other work product provided by the Engineer to the Mobility Authority and resulting from the Services performed under this Contract are intended by the Engineer solely for the use for which they were originally prepared. Notwithstanding anything contained herein to the contrary, the Engineer shall have no liability for the use by the Mobility Authority of any work product generated by the Engineer under this Contract on any Project other than for the specific purpose and Project for which the work product was prepared.

D. Disposition of Documents. All documents prepared by Engineer and all documents furnished to Engineer by the Mobility Authority shall be delivered to the Mobility Authority upon request. Engineer, at its own expense, may retain copies of such documents or any other data which it has furnished the Mobility Authority under this contract, but further use of the data is subject to permission by the Mobility Authority.

E. Release of Design Plan. The Engineer (1) will not release any roadway design plan created or collected under this contract except to its subconsultants as necessary to complete the contract; (2) shall include a provision in all subcontracts which acknowledges the Mobility Authority's ownership of the design plan and prohibits its use for any use other than the project identified in this contract; and (3) is responsible for any improper use of the design plan by its employees, officers, or subconsultants, including costs, damages, or other liability resulting from improper use. Neither Engineer nor any subconsultant may charge a fee for any portion of the design plan created by the Mobility Authority."

ARTICLE 8. PUBLIC INFORMATION AND CONFIDENTIALITY

A. Public Information. The Mobility Authority will comply with Government Code, Chapter 552, (the "Public Information Act") in the release of information produced under this Contract. The requirements of Subchapter J, of the Public Information Act, may apply to this Contract and the Engineer agrees that the Contract can be terminated if the Engineer knowingly or intentionally fails to comply with a requirement of that subchapter.

B. Confidentiality. The Engineer shall not disclose information obtained from the Mobility Authority under this contract without the express written consent of the Executive Director. All employees of the Engineer and its subconsultants working on the Project may be required to sign a non-disclosure and confidentiality agreement.

C. Access to Information. The Engineer is required to make any information created or exchanged with the Mobility Authority pursuant to this contract, and not otherwise excepted from disclosure under the Texas Public Information Act, available in a format that is accessible by the public at no additional charge to the Mobility Authority.

ARTICLE 9. PERSONNEL, EQUIPMENT AND MATERIAL

A. Engineer Resources. The Engineer shall furnish and maintain an office for the performance of all services, in addition to providing adequate and sufficient personnel and equipment to perform the services required under the contract. The Engineer certifies that it presently has adequate qualified personnel in its employment for performance of the services required under this contract, or it will be able to obtain such personnel from sources other than the Mobility Authority.

B. Removal of Employee. All employees of the Engineer assigned to this contract shall have such knowledge and experience as will enable them to perform the duties assigned to them. The Executive Director

may instruct the Engineer to remove any employee from association with work authorized in this contract if, in the sole opinion of the Executive Director, the work of that employee does not comply with the terms of this contract or if the conduct of that employee becomes detrimental to the work; or for any other reason identified by the Executive Director.

C. Mobility Authority Approval of Replacement Personnel. The Engineer may not replace any Key Team Member, as designated in the applicable Work Authorization, without prior written approval of the Director of Engineering. If any Key Team Member cease to work on this Contract, the Engineer must notify the Director of Engineering in writing as soon as possible, but in any event within (3) three business days. The notification must give the reason for removal. The Engineer must receive written approval from the Director of Engineering of proposed replacement Key Team Member. The Director of Engineering's approval will be based upon the proposed replacement Key Team Member qualifications to provide the required Services. Approval will not be unreasonably withheld.

D. Liquidated Damages. The selection of Engineer to provide the Services under this Contract was based, in part, on the Key Team Member identified in Engineer's proposal. Because of the importance and unique nature of the Services to be provided by Key Team Member identified in Attachment C it is impractical to calculate the actual losses that would be suffered by the Mobility Authority by the loss of Key Team Member from the Contract. Therefore, the Engineer agrees to compensate the Mobility Authority for its losses by paying liquidated damages in the amount of \$2,500 per day per Key Team Member position in Attachment C if any Key Team Member is removed by the Engineer by reassignment without prior written approval from the Director of Engineering. Liquidated damages will accrue from the date the Engineer removes the Key Team Member in Attachment C from the Contract if the parties do not agree on a replacement within (14) calendar days after the Key Team Member are removed from the Contract. If a replacement is agreed upon within that fourteen (14) calendar day period the liquidated damages will be waived. Liquidated damages shall cease when the parties agree on a substitute or when the Contract is terminated.

E. Ownership of Acquired Property. Except to the extent that a specific provision of this contract states to the contrary, and as provided in subarticle 7.B, the Mobility Authority shall own all intellectual property acquired or developed under this contract and all equipment purchased by the Engineer or its subconsultants under this contract. All intellectual property and equipment owned by the Mobility Authority shall be delivered to the Director of Engineering when the contract terminates, or when it is no longer needed for work performed under this Contract, whichever occurs first. In the event that a capital item is purchased for the sole use of the Mobility Authority, title shall pass or transfer to the Mobility Authority upon acquisition and prior to any use of the item by the Engineer.

ARTICLE 10. SUBCONTRACTING

A. Prior Approval. The Engineer shall not assign, subcontract, or transfer any portion of Services related to the work under this Contract unless specified in an executed Work Authorization or otherwise without first obtaining the prior written approval from the Executive Director. Request for approval should include a written description of the proposed services, and, using rates established in Attachment E, a proposed price.

B. DBE/HUB Compliance. The Engineer's subcontracting program shall comply with the DBE/HUB requirements described in the Work Authorization(s).

C. Required Provisions. All subcontracts for professional services shall include the provisions included in Attachment A, General Provisions, and any provisions required by law.

D. Invoice Approval and Processing. All subconsultants shall prepare and submit their invoices on the same billing cycle and format as the Engineer (so as to be included in invoices submitted by the Engineer).

E. Engineer Responsibilities. No subcontract shall relieve the Engineer of any of its responsibilities under this Contract and of any liability for work performed under this Contract, even if performed by a subconsultant or other third party performing work for or on behalf of the Engineer.

ARTICLE 11. INSPECTION OF WORK

A. Review Rights. Under this Contract, the Mobility Authority, TxDOT, and the U.S. Department of

Transportation, and any authorized representative of the Mobility Authority, TxDOT, or the U.S. Department of Transportation, shall have the right at all reasonable times to inspect, review or otherwise evaluate the work performed hereunder and the premises in which it is being performed.

B. Reasonable Access. If any review or evaluation is made on the premises of the Engineer or a subconsultant under this Article, the Engineer shall provide and require its subconsultants to provide all reasonable facilities and assistance for the safety and convenience of the persons performing the review in the performance of their duties.

ARTICLE 12. SUBMISSION OF REPORTS

All applicable study reports shall be submitted in preliminary form for approval by the Director of Engineering before a final report is issued. The Director of Engineering's comments on the Engineer's preliminary report must be addressed in the final report. Draft reports shall be considered confidential unless otherwise indicated by the Director of Engineering.

ARTICLE 13. VIOLATION OF CONTRACT TERMS

A. Increased Costs. Violation of contract terms, breach of contract, or default by the Engineer shall be grounds for termination of the contract, and any increased or additional cost incurred by the Mobility Authority arising from the Engineer's default, breach of contract or violation of contract terms shall be paid by the Engineer.

B. Remedies. This agreement shall not be considered as specifying the exclusive remedy for any default, and all remedies existing at law and in equity may be availed of by either party and shall be cumulative.

ARTICLE 14. TERMINATION

A. Causes. The contract may be terminated before the stated completion date by any of the following conditions.

1. By mutual agreement and consent, in writing from both parties.
2. By the Executive Director by notice in writing to the Engineer as a consequence of failure by the Engineer to perform the Services set forth herein in a satisfactory manner or if the Engineer violates the provisions of Article 20, Gratuities, or DBE/HUB Requirements.
3. By either party, upon the failure of the other party to fulfill its obligations as set forth herein, following thirty (30) days written notice and opportunity to cure.
4. By the Executive Director for his convenience and in his sole discretion, not subject to the consent of the Engineer, by giving thirty (30) days written notice of termination to the Engineer.
5. By satisfactory completion of all services and obligations described herein.

B. Measurement. Should the Executive Director terminate this Contract as herein provided, no fees other than fees due and payable at the time of termination shall thereafter be paid to the Engineer. In determining the value of the work performed by the Engineer prior to termination, the Executive Director shall be the sole judge. Compensation for work at termination will be based on a percentage of the work completed at that time. Should the Executive Director terminate this Contract under subarticles 14.A.3 & 4, the Engineer shall not incur costs during the thirty-day notice period in excess of the amount incurred during the preceding thirty (30) days.

C. Value of Completed Work. If the Engineer defaults in the performance of this contract or if the Executive Director terminates this contract for fault on the part of the Engineer, the Executive Director will give consideration to the following when calculating the value of the completed work: (1) the actual costs incurred (not to exceed the rates set forth in the applicable Work Authorization) by the Engineer in performing the work to the date of default; (2) the amount of work required which was satisfactorily completed to date of default; (3) the value of the work which is usable to the Mobility Authority; (4) the cost to the Mobility Authority of employing another firm to complete the required work; (5) the time required to employ another firm to complete the work; (6) delays in opening a revenue-generating Project and costs (including lost revenues) resulting therefrom; and (7) other factors which affect the value to the Mobility Authority of the work performed.

D. Excusable Delays. Except with respect to defaults of subconsultants, the Engineer shall not be in default by reason of any failure in performance of this Contract in accordance with its terms (including any failure to progress in the performance of the work) if such failure arises out of causes beyond the control and without the

default or negligence of the Engineer. Such causes may include, but are not restricted to, acts of God or the public enemy, acts of the Government in either its sovereign or contractual capacity, fires, floods, epidemics, quarantine restrictions, strikes, freight embargoes, and unusually severe weather.

E. Surviving Requirements. The termination of this contract and payment of an amount in settlement as prescribed above shall extinguish the rights, duties, and obligations of the Mobility Authority and the Engineer under this contract, except for those provisions that establish responsibilities that extend beyond the Contract Period, including without limitation the provisions of Article 16.

F. Payment of Additional Costs. If termination of this contract is due to the failure of the Engineer to fulfill its contract obligations, the Mobility Authority may take over the project and prosecute the work to completion, and the Engineer shall be liable to the Mobility Authority for any additional cost to the Mobility Authority.

ARTICLE 15. COMPLIANCE WITH LAWS

The Engineer shall comply with all applicable federal, state and local laws, statutes, codes, ordinances, rules and regulations, and the orders and decrees of any court, or administrative bodies or tribunals in any manner affecting the performance of this Contract, including, without limitation, worker's compensation laws, minimum and maximum salary and wage statutes and regulations, nondiscrimination, licensing laws and regulations, the Mobility Authority's enabling legislation (Chapter 370 of the Texas Transportation Code), and all amendments and modifications to any of the foregoing, if any. The Engineer shall comply with all applicable Authority policies and procedures as outlined in the Mobility Authority Policy Code handbook available on the Authority's website (<https://www.mobilityauthority.com/about/policy-disclaimers/code>). When required, the Engineer shall furnish the Mobility Authority with satisfactory proof of its compliance therewith.

ARTICLE 16. INDEMNIFICATION

A. Indemnification. *THE ENGINEER SHALL INDEMNIFY AND HOLD HARMLESS THE MOBILITY AUTHORITY AND ITS OFFICERS, DIRECTORS, EMPLOYEES, AGENTS AND CONSULTANTS WHICH, FOR THE PURPOSES OF THIS CONTRACT, SHALL INCLUDE THE MOBILITY AUTHORITY'S GEC, GENERAL COUNSEL, BOND COUNSEL, FINANCIAL ADVISORS, TRAFFIC AND REVENUE ENGINEERS, TOLL OPERATIONS/COLLECTIONS FIRMS, AND UNDERWRITERS (COLLECTIVELY THE "INDEMNIFIED PARTIES") FROM ANY CLAIMS, COSTS, OR LIABILITIES OF ANY TYPE OR NATURE AND BY OR TO ANY PERSONS WHOMSOEVER, TO THE EXTENT CAUSED BY THE NEGLIGENT ACTS, ERRORS, OR OMISSIONS OF THE ENGINEER OR ITS OFFICERS, DIRECTORS, EMPLOYEES, SUBCONSULTANTS AND AGENTS WITH RESPECT TO THE ENGINEER'S PERFORMANCE OF THE WORK TO BE ACCOMPLISHED UNDER THIS CONTRACT OR ACTIONS RESULTING IN CLAIMS AGAINST THE INDEMNIFIED PARTIES. IN SUCH EVENT, THE ENGINEER SHALL ALSO INDEMNIFY AND HOLD HARMLESS THE MOBILITY AUTHORITY AND ITS OFFICERS, DIRECTORS, AND EMPLOYEES AND THE INDEMNIFIED PARTIES FROM ANY AND ALL REASONABLE AND NECESSARY EXPENSES, INCLUDING REASONABLE ATTORNEYS' FEES, INCURRED BY THE MOBILITY AUTHORITY OR ANY OF THE INDEMNIFIED PARTIES IN LITIGATING OR OTHERWISE RESISTING SAID CLAIMS, COSTS OR LIABILITIES. IN THE EVENT THE MOBILITY AUTHORITY AND ITS OFFICERS, DIRECTORS, AND EMPLOYEES AND/OR ANY OF THE INDEMNIFIED PARTIES, IS/ARE FOUND TO BE PARTIALLY AT FAULT, THE ENGINEER SHALL, NEVERTHELESS, INDEMNIFY THE MOBILITY AUTHORITY AND ITS OFFICERS, DIRECTORS, AND EMPLOYEES AND/OR ANY OF THE INDEMNIFIED PARTIES FROM AND AGAINST THE PERCENTAGE OF FAULT ATTRIBUTABLE TO THE ENGINEER OR ITS OFFICERS, DIRECTORS, EMPLOYEES, SUBCONSULTANTS AND AGENTS OR TO THEIR CONDUCT.*

ARTICLE 17. ENGINEER'S RESPONSIBILITY

A. Accuracy. The Engineer shall have total responsibility for the accuracy and completeness of all work prepared and completed under this Contract and shall check all such material accordingly. The Engineer shall promptly make necessary revisions or corrections resulting from its errors, omissions, or negligent acts without additional compensation.

B. Errors and Omissions. The Mobility Authority and Engineer will address errors and omissions as follows:

1. The Engineer's responsibility for all questions and/or clarification of any ambiguities arising from errors and omissions will be determined by the Executive Director.
2. A problem resulting from an error and omission may be identified during the development of the PS&E, Engineering SpecDelwWA

as well as before, during, or after construction. The Engineer will be responsible for errors and omissions before, during, and after construction of a Project, as well as before and after Contract termination.

3. The phrase error and omission is used throughout to mean an error, an omission, or a combination of error and omission.
4. When an apparent error and omission is identified in work provided by the Engineer, the Executive Director will notify the Engineer of the problem and involve the Engineer in efforts to resolve it and determine the most effective solution, provided that the Executive Director shall ultimately determine the solution that is chosen.
5. Errors and omissions identified during PS&E development/prior to Project construction will be corrected at the Engineer's expense with no additional cost to the Mobility Authority.
6. During and after construction, errors and omissions can potentially result in significant additional costs to the Mobility Authority that they would not have incurred if the construction plans had been correct. The resulting additional costs are considered damages that the Mobility Authority will collect from the Engineer, including through offset to amounts owed to the Engineer.
7. After a Project is constructed and is in use, there is a possibility of a contractor claim that may involve a previous error and omission by the Engineer identified during construction; it is also possible the Engineer could be responsible for some or all of the cost of the contractor claim. If there is a possibility of Engineer responsibility, upon notice of the contractor claim, the Executive Director must notify the Engineer of the situation and provide the Engineer the opportunity to contribute any information to the Executive Director that may be useful in addressing the contractor claim. The Engineer will not be involved in any discussions or negotiations with the contractor during the claims process. Upon settlement of all previous claims with the contractor, if additional costs are identified, the Executive Director should consider the same factors as during construction in determining the Engineer's level of responsibility.
8. The additional costs which are considered damages to the Mobility Authority and are to be recovered should represent actual cost to the Mobility Authority.
9. The Executive Director will not accept in-kind services from the Engineer as payment for additional costs owed.
10. The Engineer is responsible for promptly correcting errors and omissions without compensation. In the situation of a dispute concerning whether or not the work is compensable, the Engineer shall not delay the work.
11. A letter will be transmitted by the Executive Director formally notifying the Engineer of payment required for the error and omission and will indicate the Engineer's apparent liability for the identified additional costs. The letter will include an outline of the errors and omissions, along with the additional costs, and references to any previous points of coordination and preliminary agreements. Within 30 calendar days of the date of the letter, a response is required from the Engineer with: (a) payment, (b) a request for a meeting, or (c) a request for the Executive Director to reconsider whether the Executive Director should pursue reimbursement for the identified error and omission. If a response or payment is not received from the Engineer, the Mobility Authority may pursue legal action against the Engineer, in addition to offset of payments to the Engineer, claims against insurance and other remedies available under the Contract.
12. It is the Executive Director's responsibility to identify errors and omissions and fairly evaluate the responsibility for additional cost when applicable. It is the responsibility of the Mobility Authority staff to ensure that the Mobility Authority's business practices are professional, fair, equitable, and reasonable.

C. Professionalism. The Engineer shall perform the services it provides under the Contract: (1) with the professional skill and care ordinarily provided by competent engineers practicing under the same or similar circumstances and professional license and (2) as expeditiously as is prudent considering the ordinary professional skill and care of a competent engineer.

D. Seal. The responsible Engineer shall sign, seal and date all appropriate engineering submissions to the Mobility Authority in accordance with the Texas Engineering Practice Act and the rules of the Texas Board of Professional Engineers and Land Surveyors.

E. Resealing of Documents. Once the work has been sealed and accepted by the Director of Engineering, the Mobility Authority, as the owner, will notify the party to this contract, in writing, of the possibility that a

Mobility Authority engineer, as a second engineer, may find it necessary to alter, complete, correct, revise or add to the work. If necessary, the second engineer will affix his seal to any work altered, completed, corrected, revised or added. The second engineer will then become responsible for any alterations, additions or deletions to the original design including any effect or impacts of those changes on the original engineer's design.

ARTICLE 18. NONCOLLUSION

A. Warranty. The Engineer warrants that it has not employed or retained any company or person, other than a bona fide employee working solely for the Engineer, to solicit or secure this Contract and that it has not paid or agreed to pay any company or Engineer any fee, commission, percentage, brokerage fee, gifts, or any other consideration, contingent upon or resulting from the award or making of this Contract.

B. Liability. For breach or violation of this warranty, the Mobility Authority shall have the right to annul this Contract without liability or, in its discretion, to deduct from the Contract compensation, or otherwise recover, the full amount of such fee, commission, percentage, brokerage fee, gift or contingent fee.

ARTICLE 19. INSURANCE

The Engineer shall furnish the Mobility Authority a properly completed Certificate of Insurance approved by the Executive Director prior to beginning work under the Contract and shall maintain such insurance through the Contract Period. The Engineer shall provide proof of insurance (and the Professional Liability Insurance discussed herein) in a form reasonably acceptable by the Executive Director. The Engineer certifies that it has and will maintain insurance coverages as follows:

A. Workers Compensation Insurance. In accordance with the laws of the State of Texas and employer's liability coverage with a limit of not less than \$1,000,000. This policy shall be endorsed to include a waiver of subrogation in favor of the Authority.

B. Comprehensive General Liability Insurance. With limits not less than \$1,000,000 for bodily injury, including those resulting in death, and \$1,000,000 for property damage on account of any one occurrence, with an aggregate limit of \$1,000,000.

C. Comprehensive Automobile Liability Insurance. Applying to owned, non-owned, and hired automobiles in an amount not less than \$1,000,000 for bodily injury, including death, to any one person, and \$1,000,000 on account on any one occurrence, and \$1,000,000 for property damage on account of any one occurrence. This policy shall not contain any limitation with respect to a radius of operation for any vehicle covered and shall not exclude from the coverage of the policy any vehicle to be used in connection with the performance of the Engineer's obligations under this Contract.

D. Excess Liability Insurance. In an amount of \$2,000,000 per occurrence and aggregate.

E. Valuable Papers Insurance. In an amount sufficient to assure the full restoration of any plans, drawings, field notes, logs, test reports, diaries, or other similar data or materials relating to the Services provided under this Contract in the event of their loss or destruction, until such time as the work has been delivered to the Authority.

F. Architects and/or Engineers Professional Liability insurance. Engineer shall provide and maintain professional liability coverage, with limits not less than \$2,000,000 per claim and \$2,000,000 aggregate. The professional liability coverage shall protect against any negligent act, error or omission arising out of design or engineering activities, including environmental related activities, with respect to the Project, including coverage for negligent acts, errors or omissions by any member of the Engineer and its subconsultants (including, but not limited to design subconsultants and subconsultants) of any tier. The policy must provide that coverage extends a minimum of three (3) years beyond the Engineer's completion of the Services. This policy shall be endorsed to include a waiver of subrogation in favor of the Authority.

G. General for All Insurance. The Engineer shall promptly, upon execution of this Contract, furnish certificates of insurance to the Executive Director indicating compliance with the above requirements.

Certificates shall indicate the name of the insured, the name of the insurance company, the name of the agency/agent, the policy number, the term of coverage, and the limits of coverage.

All policies are to be written through companies (a) authorized to transact that class of insurance in the State of Texas; (b) rated (i), with respect to the companies providing the insurance under subarticles 19.A. through D., above, by A. M. Best Company as "A-X" or better (or the equivalent rating by another nationally recognized rating service) and (ii) with respect to the company providing the insurance under subarticle 19.E., a rating by A. M. Best Company or similar rating service satisfactory to the Mobility Authority and/or its insurance consultant; and (c) otherwise acceptable to the Executive Director.

All policies are to be written through companies authorized to transact that class of insurance in the State of Texas. Such insurance shall be maintained in full force and effect during the life of this Contract or for a longer term as may be otherwise provided for hereunder. Insurance furnished under subarticles 19.B., C., and D., above, shall name the Mobility Authority as additional insured and shall protect the Authority, its officers, employees, and directors, agents, and representatives from claims for damages for bodily injury and death and for damages to property arising in any manner from the negligent or willful acts or failures to act by the Engineer, its officers, employees, directors, agents, and representatives in the performance of the Services rendered under this Contract. Certificates shall also indicate that the contractual liability assumed in Article 16, above, is included.

The insurance carrier shall include in each of the insurance policies required under subarticles 19.A. through F., the following statement: "This policy will not be canceled or materially changed during the period of coverage without at least thirty (30) days prior written notice addressed to the Central Texas Regional Mobility Authority, 3300 N. IH-35, Suite 300, Austin, Texas 78705, Attn: Executive Director"

H. Subconsultant. The Engineer shall be liable for work performed by the subconsultant and Engineer's insurance shall cover the work, actions, errors and omissions of the subconsultant.

ARTICLE 20. GRATUITIES

A. Employees Not to Benefit. Mobility Authority policy mandates that the director, employee or agent of the Mobility Authority shall not accept any gift, favor, or service that might reasonably tend to influence the director, employee or agent in making of procurement decisions. The only exceptions allowed are ordinary business lunches and items that have received the advance written approval of the Executive Director of the Mobility Authority.

B. Liability. Any person doing business with or who reasonably speaking may do business with the Mobility Authority under this Contract may not make any offer of benefits, gifts or favors to Mobility Authority employees, except as mentioned above. Failure on the part of the Engineer to adhere to this policy may result in the termination of this Contract.

ARTICLE 21. DISADVANTAGED BUSINESS ENTERPRISE OR HISTORICALLY UNDERUTILIZED BUSINESS REQUIREMENTS

The Engineer agrees to comply with the DBE/HUB requirements and reporting guidelines set forth in the Work Authorization(s). The DBE/HUB Goal established for this Project is as set forth in the Work Authorization. The Engineer also agrees to comply with the DBE/HUB subcontracting plan that was included in the response that the Engineer submitted to the Mobility Authority's Request for Qualifications or Request for Proposals.

ARTICLE 22. MAINTENANCE, RETENTION AND AUDIT OF RECORDS

A. Retention Period. The Engineer shall maintain all books, documents, papers, accounting records and other evidence pertaining to costs incurred and Services provided (hereinafter called the Records). The Engineer shall make the Records available at its office during the Contract Period and for four (4) years from the date of final payment under this Contract, until completion of all audits, or until pending litigation has been completely and fully resolved, whichever occurs last.

B. Availability. The Mobility Authority shall have the exclusive right to examine the books and records of the Engineer for the purpose of checking the amount of work performed by the Engineer. The Engineer shall maintain all books, documents, papers, accounting records and other evidence pertaining to cost incurred and shall make such materials available at its office during the Contract Period and for four (4) years from the date of final payment under this Contract or until pending litigation has been completely and fully resolved,

whichever occurs last. The Mobility Authority or any of its duly authorized representatives, TxDOT, FHWA, the United States Department of Transportation Office of Inspector General, and the Comptroller General shall have access to any and all books, documents, papers and records of the Engineer which are directly pertinent to this Contract for the purpose of making audits, examinations, excerpts and transcriptions.

ARTICLE 23. CERTIFICATE OF INTERESTED PARTIES

If applicable, the Engineer must comply with the Certificate of Interested Parties (Form 1295) adopted by the Texas Legislature as House Bill 1295, which added section 2252.908 of the Government Code, available for review at the Texas Ethics Commission website: <https://www.ethics.state.tx.us/>.

ARTICLE 24. CIVIL RIGHTS COMPLIANCE

A. Compliance with Regulations: The Engineer shall comply with the Acts and Regulations relative to Nondiscrimination in Federally-assisted programs of the U.S. Department of Transportation (USDOT), the Federal Highway Administration (FHWA), as they may be amended from time to time, which are herein incorporated by reference and made part of this contract.

B. Nondiscrimination: The Engineer, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, sex, or national origin in the selection and retention of subconsultants, including procurement of materials and leases of equipment. The Engineer will not participate directly or indirectly in the discrimination prohibited by the Acts and the Regulations, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR Part 21.

C. Solicitations for Subcontracts, Including Procurement of Materials and Equipment: In all solicitations either by competitive bidding or negotiation made by the Engineer for work to be performed under a subcontract, including procurement of materials or leases of equipment, each potential subconsultant or supplier will be notified by the Engineer of the Engineer's obligations under this contract and the Acts and Regulations relative to Nondiscrimination on the grounds of race, color, sex, or national origin.

D. Information and Reports: The Engineer will provide all information and reports required by the Acts and Regulations, and directives issued pursuant thereto, and will permit access to its books, records, accounts, other sources of information, and facilities as may be determined by the Mobility Authority or the FHWA to be pertinent to ascertain compliance with such Acts and Regulations or directives. Where any information required of the Engineer is in the exclusive possession of another who fails or refuses to furnish this information, the Engineer will so certify to the Mobility Authority or the Federal Highway Administration, as appropriate, and will set forth what efforts it has made to obtain the information.

E. Sanctions for Noncompliance: In the event of the Engineer's noncompliance with the Nondiscrimination provisions of this contract, the Mobility Authority will impose such contract sanctions as it or the FHWA may determine to be appropriate, including, but not limited to:

- (1) withholding of payments to the Engineer under the contract until the Engineer complies and/or
- (2) cancelling, terminating, or suspending of the contract, in whole or in part.

F. Incorporation of Provisions: The Engineer will include the provisions of paragraphs (A) through (E) in every subcontract, including procurement of materials and leases of equipment, unless exempt by the Acts and Regulations and directives issued pursuant thereto. The Engineer will take such action with respect to any subcontract or procurement as the Mobility Authority, TxDOT, or the FHWA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the Engineer becomes involved in, or is threatened with, litigation with a subcontractor or supplier because of such direction, the Engineer may request the Mobility Authority to enter into such litigation to protect the interests of the Mobility Authority.

ARTICLE 25. PATENT RIGHTS

The Mobility Authority shall have the royalty free, nonexclusive and irrevocable right to use and to authorize others to use any patents developed by the Engineer under this contract.

ARTICLE 26. COMPUTER GRAPHICS FILES

The Engineer agrees to comply with Attachment G, Computer Graphics Files for Document and Information

Exchange, if determined by the Mobility Authority to be applicable to this contract.

ARTICLE 27. CHILD SUPPORT CERTIFICATION

Under Section 231.006, Texas Family Code, the Engineer certifies that the individual or business entity named in this contract, bid, or application is not ineligible to receive the specified grant, loan, or payment and acknowledges that this contract may be terminated and payment may be withheld if this certification is inaccurate. If the above certification is shown to be false, the Engineer is liable to the state for attorney's fees, the cost necessary to complete the contract, including the cost of advertising and awarding a second contract, and any other damages provided by law or the contract. A child support obligor or business entity ineligible to receive payments because of a payment delinquency of more than thirty (30) days remains ineligible until: all arrearages have been paid; the obligor is in compliance with a written repayment agreement or court order as to any existing delinquency; or the court of continuing jurisdiction over the child support order has granted the obligor an exemption from Subsection (a) of Section 231.006, Texas Family Code, as part of a court-supervised effort to improve earnings and child support payments.

ARTICLE 28. DISPUTES

A. Disputes Not Related to Contract Services. The Engineer shall be responsible for the settlement of all contractual and administrative issues arising out of any procurement made by the Engineer in support of the services authorized herein.

B. Disputes Concerning Work or Cost. The Executive Director of the Mobility Authority shall decide all questions, difficulties and disputes of any nature whatsoever that may arise under or by reason of this Contract, and his decision upon all claims, questions and disputes shall be final. The Engineer shall comply with the decision of the Executive Director with regard to the resolution of any such disputes.

ARTICLE 29. SUCCESSORS AND ASSIGNS

The Engineer and the Mobility Authority do each hereby bind themselves, their successors, executors, administrators and assigns to each other party of this Contract and to the successors, executors, administrators and assigns of such other party in respect to all covenants of this contract. The Engineer shall not assign, subcontract or transfer its interest in this contract without the prior written consent of the Executive Director.

ARTICLE 30. SEVERABILITY

In the event any one or more of the provisions contained in this Contract shall for any reason be held to be invalid, illegal, or unenforceable in any respect, such invalidity, illegality, or unenforceability shall not affect any other provision thereof and this Contract shall be construed as if such invalid, illegal, or unenforceable provision had never been contained herein.

ARTICLE 31. PRIOR CONTRACTS SUPERSEDED

This Contract, including all attachments, constitutes the sole agreement of the parties hereto for the Services authorized herein and supersedes any prior understandings or written or oral contracts between the parties respecting the subject matter defined herein.

ARTICLE 32. CONFLICT OF INTEREST

A. Representation by Engineer.

The Engineer represents that it has no conflict of interest that would in any way interfere with its or its employees' performance of Services for the Mobility Authority or which in any way conflicts with the interests of the Mobility Authority and certifies that it is in full compliance with the Mobility Authority's Policy Code related to Conflicts of Interest. The Engineer shall prevent any actions or conditions that could result in a conflict with the Mobility Authority's interests.

B. Certification Status. The Engineer certifies that it is not:

1. a person required to register as a lobbyist under Chapter 305, Government Code;
2. a public relations firm; or
3. a government consultant.

C. Environmental Disclosure. If the Engineer will prepare an environmental impact statement or an

environmental assessment under this Contract, the Engineer certifies by executing this Contract that it has no financial or other interest in the outcome of the Project on which the environmental impact statement or environmental assessment is prepared.

D. Engineering Services for the Construction Contractor. Specific to the Project for which the Services are being provided under this Contract, the Engineer shall not provide services directly to the contractor responsible for constructing the Project unless approved by the Executive Director.

ARTICLE 33. AUDIT REQUIREMENTS

The parties shall comply with the requirements of the Single Audit Act of 1984, P.L. 98-502, ensuring that the single audit report includes the coverage stipulated in 2 CFR 200.

ARTICLE 34. DEBARMENT CERTIFICATIONS

The parties are prohibited from making any award at any tier to any party that is debarred or suspended or otherwise excluded from or ineligible for participation in Federal Assistance Programs under Executive Order 12549, "Debarment and Suspension." By executing this Contract, the Engineer certifies that it is not currently debarred, suspended, or otherwise excluded from or ineligible for participation in Federal Assistance Programs under Executive Order 12549. The parties to this contract shall require any party to a subcontract or purchase order awarded under this contract to certify its eligibility to receive Federal funds and, when requested by the Executive Director, to furnish a copy of the certification.

ARTICLE 35. PERTINENT NON-DISCRIMINATION AUTHORITIES

During the performance of this contract, the Engineer, for itself, its assignees, and successors in interest agree to comply with the following nondiscrimination statutes and authorities; including but not limited to:

- A.** Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d et seq., 78 stat. 252), (prohibits discrimination on the basis of race, color, national origin); and 49 CFR Part 21.
- B.** The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601), (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects).
- C.** Federal-Aid Highway Act of 1973, (23 U.S.C. § 324 et seq.), as amended, (prohibits discrimination on the basis of sex).
- D.** Section 504 of the Rehabilitation Act of 1973, (29 U.S.C. § 794 et seq.) as amended, (prohibits discrimination on the basis of disability); and 49 CFR Part 27.
- E.** The Age Discrimination Act of 1975, as amended, (42 U.S.C. § 6101 et seq.), (prohibits discrimination on the basis of age).
- F.** Airport and Airway Improvement Act of 1982, (49 U.S.C. Chapter 471, Section 47123), as amended, (prohibits discrimination based on race, creed, color, national origin, or sex).
- G.** The Civil Rights Restoration Act of 1987, (PL 100-209), (Broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, The Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, subrecipients and contractors, whether such programs or activities are Federally funded or not).
- H.** Titles II and III of the Americans with Disabilities Act, which prohibits discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities (42 U.S.C. §§ 12131-12189) as implemented by Department of Transportation regulations at 49 C.F.R. parts 37 and 38.

I. The Federal Aviation Administration’s Nondiscrimination statute (49 U.S.C. § 47123) (prohibits discrimination on the basis of race, color, national origin, and sex).

J. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, which ensures nondiscrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations.

K. Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, and resulting agency guidance, national origin discrimination includes discrimination because of limited English proficiency (LEP). To ensure compliance with Title VI, the parties must take reasonable steps to ensure that LEP persons have meaningful access to the programs (70 Fed. Reg. at 74087 to 74100).

L. Title IX of the Education Amendments of 1972, as amended, which prohibits the parties from discriminating because of sex in education programs or activities (20 U.S.C. 1681 et seq.).

ARTICLE 36. BOYCOTT ISRAEL

The Contractor represents and warrants that (1) it does not, and shall not for the duration of this Contract, boycott Israel or (2) the verification required by Section 2271.002 of the Texas Government Code does not apply to this Contract.

ARTICLE 37. FIREARM ENTITIES AND TRADE ASSOCIATIONS DISCRIMINATION

The Engineer verifies that:

1. It does not, and will not for the duration of this Contract, have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; or
2. The verification required by Section 2274.002 of the Texas Government Code does not apply to the contract.

If circumstances relevant to this provision change during the course of this Contract, Engineer shall promptly notify the Executive Director.

ARTICLE 38. ENERGY COMPANY BOYCOTT

The Engineer verifies that:

1. It does not, and will not for the duration of the contract, boycott energy companies; or
2. The verification required by Section 2274.002 of the Texas Government Code does not apply to the contract.

If circumstances relevant to this provision change during the course of this Contract, the Engineer shall promptly notify the Executive Director.

ARTICLE 39. ABBREVIATIONS AND DEFINITIONS

Acts and Regulations	Federal, state, and local acts and regulations which are applicable to the Contract
Agreement	This Contract
Mobility Authority	The Central Texas Regional Mobility Authority
Business Days	Any day the Mobility Authority is open for business
CFR	Code of Federal Regulations
Contract	This contract document and its attachments
Days	Calendar days
DBE	Disadvantaged Business Enterprise
Engineer	The service provider performing the services under this Contract
Executive Director	The Executive Director of the Mobility Authority, or anyone to whom he has delegated the authority to act on his behalf

FAR	Federal Acquisition Regulations
FHWA	Federal Highway Administration
GEC	General Engineering Consultant
HUB	Historically Underutilized Business
OMB	Office of Management and Budget
Project	Any capital improvement, rehabilitation, repair, maintenance, or other work in conjunction with the Authority's or a partner's facilities.
PS&E	Plans, specifications, and estimate
Services	Any work assigned under this contract
TxDOT	Texas Department of Transportation
USDOT	United States Department of Transportation
Work Authorization	Any work authorization arising from this Contract
Year	When not otherwise clarified, "year" refers to a 12-month period

ATTACHMENT B
SERVICES TO BE PROVIDED BY THE MOBILITY AUTHORITY

The Mobility Authority shall perform and provide the following in a timely manner so as not to delay the Services to be provided by the Engineer:

1. Authorize the Engineer in writing to proceed.
2. Designate in writing a person to act as the Mobility Authority's representative, such person to have complete authority to transmit instructions, receive information, and interpret and define Authority's decisions with respect to the Services to be provided by the Engineer.
3. Render reviews, decisions and approvals as promptly as necessary to allow for the expeditious performance of the Services to be provided by the Engineer.
4. Provide timely review and decisions in response to the Engineer's request for information and/or required submittals and deliverables.
5. Maintain the Project's website and other public involvement materials.
6. Provide the Engineer with relevant data available to the Mobility Authority related to people, agencies and organizations interested in the project.
7. Either provide directly or have its designated General Engineering Consultant (GEC) provide general oversight services of the Engineer.
8. Provide for inspections of tolling equipment (including ITS elements and lightning protection).
9. Place at Engineer's disposal all reasonably available information pertinent to the Project.
10. Coordinate with utility companies for relocation efforts and any agreements needed for such.
11. Provide existing or updated utility information.
12. Provide assistance in coordinating with the Contractor, Corps of Engineers, FEMA, Travis County, City of Austin, and TxDOT for any approvals and permits required.
13. Address problems regarding any refusal to grant right of entry (ROE) or communication with landowners who are hostile with respect to the completion of this scope of services.

ATTACHMENT C SERVICES TO BE PROVIDED BY THE ENGINEER

The Engineer will be required to provide professional services including providing and maintaining qualified construction engineering, inspection, materials testing and survey quality assurance staff availability to oversee, review and document construction activities performed by a contractor separately selected by the Mobility Authority for the assigned project (Contractor). The general elements of work that will be required by the Mobility Authority are shown below.

1. Project Controls

The Engineer shall provide Project correspondence, Record keeper duties, Document control, project scheduling, Contractor draw requests, changes/assessment, Project reporting, and external auditing interface.

2. Construction Engineering

The Engineer will provide quality control and assurance for the construction of the project through construction engineering and management in accordance with the plans, specifications, and approved Construction Quality Management Plan to be developed by the Engineer in collaboration with the Mobility Authority.

3. Construction Inspections

The Engineer's inspection team shall perform and report construction inspections of all operations related to structures, roadway, drainage, traffic (i.e. signs, striping, signals, illumination, ITS), stormwater pollution prevention plan and traffic control to validate that the Contractor's work, including sequencing of work, is conducted in accordance with the approved contract documents.

4. Survey Oversight

Survey oversight is primarily intended as survey quality assurance of the efforts of the Contractor and the Contractor's surveyor.

5. Materials Engineering and Acceptance

Provide a Qualification Program for materials utilized for the construction of the Project in accordance with the Authority's Quality Acceptance Program ("QAP"). Maintain documentation of all qualified individuals who perform required tests for acceptance of materials.

ATTACHMENT D
NOT APPLICABLE

**ATTACHMENT E
FEE SCHEDULE
(Final Cost Proposal)**

This attachment provides the basis of payment and fee schedule. **The basis of payment for this contract is indicated by an “X” in the applicable box.** The basis shall be supported by the Final Cost Proposal (FCP) shown below. If more than one basis of payment is used, each one must be supported by a separate FCP.

“X”	Basis	
<input type="checkbox"/>	Lump Sum	<p>The lump sum shall be equal to the maximum amount payable. The lump sum includes all direct and indirect costs and profit. For payment the Engineer is not required to provide evidence of actual hours worked, travel, overhead rates or other evidence of cost, but must submit billing information in a form acceptable to the Mobility Authority as required by Article 4 A & B including classifying work, partial or completed, according to the Table of Deliverables.</p> <p>The Mobility Authority will agree to pay Engineer, and the Engineer will agree to accept as full and sufficient compensation and reimbursement for the performance of all Services as set forth in this Contract and the Work Authorization, a Lump Sum amount for the specified category of services.</p> <p>The Lump Sum will include compensation for Engineer's services and services of subconsultants, if any. Appropriate amounts will be incorporated in the Lump Sum to account for labor, overhead, profit, and reimbursable expenses.</p> <p>The portion of the Lump Sum amount billed for Engineer's Services will be based upon Engineer's estimate, as approved by the Mobility Authority's Director of Engineering, of the proportion of the total Services completed during the billing period to the Lump Sum amount.</p>

<input checked="" type="checkbox"/>	<p>Unit Cost</p>	<p>The unit cost(s) for each type of unit and number of units are shown in the FCP. The unit cost includes all direct and indirect costs and profit. For payment, the Engineer is not required to provide evidence of actual hours worked, travel, overhead rates or any other cost data. The FCP may include special items, such as equipment which are not included in the unit costs. Documentation of these special costs may be required. The maximum amount payable equals the total of all units times their respective unit cost plus any special direct items shown.</p> <p>The Mobility Authority will agree to pay the Engineer, and the Engineer will agree to accept as full and sufficient compensation and reimbursement for the performance of all Services as set forth in this Contract and the Work Authorization, an agreed upon unit price multiplied by the number of units completed for each billing.</p> <p>Each invoice submitted shall identify the specific Contract task(s) and completed work product/deliverable for the agreed upon price outlined in the Work Authorization.</p>
<input checked="" type="checkbox"/>	<p>Specified Rate Basis</p>	<p>The specified rates for each type of labor are shown in the FCP below. The FCP may include special items, such as equipment which are not included in the specified rates. The specified rate includes direct labor and indirect cost and profit. The Mobility Authority may request documentation of reimbursable direct costs including hours worked. Documentation of special item costs may be required. The specified rate is not subject to audit. Revisions to the specified rates may be proposed no more frequently than once per calendar year, and no sooner than 12 months after the Effective Date and are subject to written approval of the Executive Director.</p> <p>The Mobility Authority will agree to pay the Engineer, and the Engineer will agree to accept as full and sufficient compensation and reimbursement for the performance of all Services as set forth in this Contract and the Work Authorization, an amount equal to the cumulative hours charged to the specific Project by each class of Engineer's employees multiplied by the Standard Hourly Rates for each applicable billing class for all Services performed on the specific Project, plus reimbursable expenses and sub consultant's charges, if any.</p>
<input type="checkbox"/>	<p>Cost Plus</p>	<p>The Mobility Authority will agree to pay, and the Engineer will agree to accept as full and sufficient compensation and reimbursement for the performance of all Services as set forth in this Contract and the Work Authorization, hourly rates for the staff working on the assignment computed as follows:</p> <p><i>Direct Labor Cost x (1.0 + Overhead Rate) x (1.0 + Profit %, in decimal form).</i></p> <p>The invoice must itemize labor rates, hours worked, other direct costs and indirect costs. The Engineer may be required to provide documentation of hours worked and any eligible direct costs claimed. The provisional overhead rate charged is subject to audit and adjustment to actual rates incurred. The FCP below shows the hourly rates for labor, other direct expenses including but not limited to travel and allowable materials, and provisional overhead rate. Actual wages must be within the allowable range shown on the Final Cost Proposal.</p>

Without prior approval by the Executive Director, the Mobility Authority shall not reimburse the Engineer for expenses associated with relocating personnel to complete the services described by this Contract. Roadway tolls incurred by the Engineer or any of its subconsultants in connection with performance of the Services will not be reimbursable under this Contract. Reimbursement shall be limited to the terms of any financial assistance or Project agreements with TxDOT or other third parties. Travel expenses will be limited to the rates published by the Texas Comptroller of Public Accounts.

Engineer acknowledges that all expenses and costs paid or reimbursed by the Mobility Authority using federal or state funds shall be paid or reimbursed in accordance with, and subject to, applicable policies of the Mobility Authority and other applicable state and federal laws, including the applicable requirements of OMB Circular A-87, which may reduce the amount of expenses and costs reimbursed to less than what was incurred.

ATTACHMENT E – FEE SCHEDULE

Final Cost Proposal (FCP) Supporting Basis of Payment

* The **MAXIMUM AMOUNT PAYABLE** is \$3,000,000.00.

The maximum amount payable is based on the following data and calculations:

* The maximum amount payable must be based on the contract scope. The work authorization fee schedules will be derived from this attachment.

ATTACHMENT E - FEE SCHEDULE

SPECIFIED RATE PAYMENT BASIS

PRIME PROVIDER NAME:		IEA, Inc.					
Job Title	Hourly Base Rate	Hourly Contract Rate 2023		Hourly Contract Rate 2024		Hourly Contract Rate 2025	
		Office	Field	Office	Field	Office	Field
		Principal	\$ 125.00	\$ 367.29	\$ 317.30	\$ 381.98	\$ 329.99
Project Manager	\$ 100.00	\$ 293.83	\$ 253.84	\$ 305.59	\$ 263.99	\$ 317.81	\$ 274.55
Lead Inspector	\$ 66.00	\$ 193.93	\$ 167.53	\$ 201.69	\$ 174.23	\$ 209.75	\$ 181.20
Senior Inspector	\$ 56.00	\$ 164.55	\$ 142.15	\$ 171.13	\$ 147.83	\$ 177.97	\$ 153.75
Inspector	\$ 46.00	\$ 135.16	\$ 116.76	\$ 140.57	\$ 121.44	\$ 146.19	\$ 126.29
Senior Records Keeper	\$ 60.00	\$ 176.30	\$ 152.30	\$ 183.35	\$ 158.39	\$ 190.69	\$ 164.73
Records Keeper	\$ 47.00	\$ 138.10	\$ 119.30	\$ 143.63	\$ 124.08	\$ 149.37	\$ 129.04
Project Engineer	\$ 60.00	\$ 176.30	\$ 152.30	\$ 183.35	\$ 158.39	\$ 190.69	\$ 164.73
Engineer in Training	\$ 40.00	\$ 117.53	\$ 101.53	\$ 122.23	\$ 105.60	\$ 127.12	\$ 109.82
CADD Technician	\$ 40.00	\$ 117.53	\$ 101.53	\$ 122.23	\$ 105.60	\$ 127.12	\$ 109.82
Administrative/Clerical	\$ 38.00	\$ 111.66	\$ 96.46	\$ 116.12	\$ 100.32	\$ 120.77	\$ 104.33
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
INDIRECT COST RATE (OFFICE):	167.12%						
INDIRECT COST RATE (FIELD):	130.76%						
PROFIT RATE:	10.00%						

ATTACHMENT E - FEE SCHEDULE

SPECIFIED RATE PAYMENT BASIS

SUBPROVIDER NAME:		G Sylva					
Job Title	Hourly Base Rate	Hourly Contract Rate 2023		Hourly Contract Rate 2024		Hourly Contract Rate 2025	
		Office	Field	Office	Field	Office	Field
		Support Manager	\$ 80.00	\$ 207.96	\$ 198.88	\$ 216.28	\$ 206.84
Senior Inspector (Structural)	\$ 50.00	\$ 129.98	\$ 124.30	\$ 135.18	\$ 129.27	\$ 140.58	\$ 134.44
Inspector (Structural)	\$ 40.00	\$ 103.98	\$ 99.44	\$ 108.14	\$ 103.42	\$ 112.47	\$ 107.55
Senior Inspector	\$ 48.00	\$ 124.78	\$ 119.33	\$ 129.77	\$ 124.10	\$ 134.96	\$ 129.07
Inspector	\$ 38.00	\$ 98.78	\$ 94.47	\$ 102.73	\$ 98.25	\$ 106.84	\$ 102.18
Administrative/Clerical	\$ 28.00	\$ 72.79	\$ 69.61	\$ 75.70	\$ 72.39	\$ 78.73	\$ 75.29
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
INDIRECT COST RATE (OFFICE):	136.32%						
INDIRECT COST RATE (FIELD):	126.00%						
PROFIT RATE:	10.00%						

**ATTACHMENT E - FEE SCHEDULE
SPECIFIED RATE PAYMENT BASIS**

SUBPROVIDER NAME:		CPY					
Job Title	Hourly Base Rate	Hourly Contract Rate 2023		Hourly Contract Rate 2024		Hourly Contract Rate 2025	
		Office	Field	Office	Field	Office	Field
RPLS - Project Manager	\$ 69.00	\$ 206.14	\$ 194.21	\$ 201.97	\$ 201.97	\$ 222.96	\$ 210.05
Support Manager	\$ 61.00	\$ 182.24	\$ 171.69	\$ 178.56	\$ 178.56	\$ 197.11	\$ 185.70
RPLS - Task Leader	\$ 51.00	\$ 152.36	\$ 143.54	\$ 149.28	\$ 149.28	\$ 164.79	\$ 155.26
Senior Survey Technician	\$ 38.50	\$ 115.02	\$ 108.36	\$ 112.70	\$ 112.70	\$ 124.40	\$ 117.20
Survey Technician	\$ 34.00	\$ 101.57	\$ 95.70	\$ 99.52	\$ 99.52	\$ 109.86	\$ 103.50
Administrative/Clerical	\$ 33.00	\$ 98.59	\$ 92.88	\$ 96.60	\$ 96.60	\$ 106.63	\$ 100.46
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
INDIRECT COST RATE (OFFICE):	171.59%						
INDIRECT COST RATE (FIELD):	155.87%						
PROFIT RATE:	10.00%						

**ATTACHMENT E - FEE SCHEDULE
SPECIFIED RATE PAYMENT BASIS**

SUBPROVIDER NAME:		B2Z Engineering					
Job Title	Hourly Base Rate	Hourly Contract Rate 2023		Hourly Contract Rate 2024		Hourly Contract Rate 2025	
		Office	Field	Office	Field	Office	Field
Support Manager / PE	\$ 95.00	\$ 255.27	\$ 232.66	\$ 265.48	\$ 241.97	\$ 276.10	\$ 251.64
Senior Materials Manager / PE	\$ 110.00	\$ 295.58	\$ 269.39	\$ 307.40	\$ 280.17	\$ 319.70	\$ 291.38
Laboratory Manager	\$ 70.00	\$ 188.10	\$ 171.43	\$ 195.62	\$ 178.29	\$ 203.44	\$ 185.42
Administrative/Clerical	\$ 35.00	\$ 94.05	\$ 85.72	\$ 97.81	\$ 89.15	\$ 101.72	\$ 92.71
Senior Technician	\$ 50.00	\$ 134.35	\$ 122.45	\$ 139.73	\$ 127.35	\$ 145.32	\$ 132.44
Technician	\$ 44.00	\$ 118.23	\$ 107.76	\$ 122.96	\$ 112.07	\$ 127.88	\$ 116.55
Field Inspector	\$ 46.00	\$ 123.61	\$ 112.66	\$ 128.55	\$ 117.16	\$ 133.69	\$ 121.85
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
		\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00	\$ 0.00
INDIRECT COST RATE (OFFICE):	144.28%						
INDIRECT COST RATE (FIELD):	122.64%						
PROFIT RATE:	10.00%						

Unit Costs - Material Testing			Consultant Proposal
Services To Be Provided	Test Code	Unit	Cost
Preparing Soil and Flexible Base Materials for Testing	Tex-101-E	each	\$85.00
Determining Moisture Content in Soil Materials	Tex-103-E	each	\$20.00
Determining Liquid Limits of Soils	Tex-104-E	each	\$50.00
Determining Plastic Soil Limits	Tex-106-E	each	\$50.00
Determining the Bar Linear Shrinkage of Soils	Tex-107-E	each	\$40.00
Determining the Specific Gravity of Soils	Tex-108-E	each	\$75.00
Particle Size Analysis of Soils	Tex-110-E	each	\$215.00
Determining the Amount of Material in Soils Finer than the 75 micrometer (No. 200) Sieve	Tex-111-E	each	\$75.00
Admixing Lime to Reduce Plasticity Index of Soils	Tex-112-E	each	\$200.00
Laboratory Compaction Characteristics and Moisture-Density Relationship of Base Materials	Tex-113-E	each	\$310.00
Laboratory Compaction Characteristics and Moisture-Density Relationship of Subgrade, Embankment Soils, and Backfill Material	Tex-114-E	each	\$300.00
Ball Mill Method for Determining the Disintegration of Flexible Base Material	Tex-116-E	each	\$250.00
Triaxial Compression Test for Disturbed Soils and Base Materials	Tex-117-E	each	\$2,300.00
Triaxial Compression Test for Undisturbed Soils	Tex-118-E	each	\$475.00
Soil-Cement Testing- Part 1	Tex-120-E	each	\$550.00
Soil-Cement Testing- Part 2	Tex-120-E	each	\$400.00
Soil-Lime Testing- Part 1	Tex-121-E	each	\$450.00
Soil-Lime Testing- Part 2	Tex-121-E	each	\$400.00
Soil-Lime Testing- Part 3	Tex-121-E	each	\$400.00
Molding, Testing, and Evaluating Bituminous Black Base Materials	Tex-126-E	each	\$2,250.00
Lime Fly-Ash Compressive Strength Test Methods- Part 1	Tex-127-E	each	\$125.00
Lime Fly-Ash Compressive Strength Test Methods- Part 2	Tex-127-E	each	\$125.00
Determining Soil pH	Tex-128-E	each	\$70.00
Measuring the Resistivity of Soil Materials	Tex-129-E	each	\$125.00
Slurry Testing	Tex-130-E	each	\$35.00
Laboratory Classification of Soils for Engineering Purposes	Tex-142-E	each	\$65.00
Determining Sulfate Content in Soils - Colorimetric Method	Tex-145-E	each	\$120.00
Conductivity Test for Field Detection of Sulfates in Soil	Tex-146-E	each	\$125.00
Soil Organic Content Using UV-Vis Method	Tex-148-E	each	\$450.00
Sieve Analysis of Fine and Coarse Aggregate	Tex-200-F	each	\$120.00
Bulk Specific Gravity and Water Absorption of Aggregate	Tex-201-F	each	\$100.00
Apparent Specific Gravity of Material Finer than No. 50 Sieve	Tex-202-F	each	\$100.00
Sand Equivalent	Tex-203-F	each	\$140.00
Laboratory Method of Mixing Bituminous Mixtures	Tex-205-F	set of 3	\$145.00
Compacting Specimens Using the Texas Gyrotory Compactor (TGC)	Tex-206-F	set of 3	\$105.00
Bulk Specific Gravity of Compacted Bituminous Mixtures	Tex-207-F (Part I)	each	\$90.00
Determining Mat Segregation Using a Density-Testing Gauge	Tex-207-F (Part V)	each	\$120.00
Bulk Specific Gravity of Compacted Bituminous Mixtures (Vacuum Method)	Tex-207-F (Part VI)	each	\$85.00
Determining Longitudinal Joint Density Using a Density Testing Gauge	Tex-207-F (Part VII)	each	\$85.00
Determining Density of Permeable Friction Course (PFC) Mixtures	Tex-207-F (Part VIII)	each	\$90.00
Test of Stabilometer Value of Bituminous Mixtures	Tex-208-F	set of 3	\$125.00
Determining Asphalt Content of Bituminous by Extraction	Tex-210-F	each	\$250.00
Determining Moisture Content of Bituminous Mixtures	Tex-212-F	each	\$45.00
Determining Deleterious Material and Decantation Test for Coarse Aggregates	Tex-217-F	each	\$100.00
Sampling Aggregate for Bituminous Mixtures, Surface Treatments and Limestone Rock Asphalt	Tex-221-F	each	\$50.00
Determining Flakiness Index	Tex-224-F	each	\$100.00
Indirect Tensile Strength Test	Tex-226-F	set of 3	\$350.00
Theoretical Maximum Specific Gravity of Bituminous Mixtures	Tex-227-F	each	\$115.00
Combined Bituminous Mixture Cold-Belt Sampling and Testing Procedure	Tex-229-F	each	\$120.00
Determining Asphalt Content of Bituminous by Ignition	Tex-236-F	each	\$180.00

Superpave Gyrotory Compacting of Test Specimens of Bituminous Mixtures	Tex-241-F	set of 2	\$175.00
Hamburg Wheel-Tracking Test	Tex-242-F	each	\$700.00
Tack Coat Adhesion	Tex-243-F	each	\$250.00
Thermal Profile of Hot Mix Asphalt	Tex-244-F	each	\$200.00
Permeability or Water Flow of Hot Mix Asphalt	Tex-246-F	each	\$100.00
Determining Flat and Elongated Particles	Tex-280-F	each	\$150.00
Compressive Strength of Cement Mortars	ASTM C109	set of 3	\$80.00
Sieve Analysis of Fine and Coarse Aggregate	Tex-401-A	each	\$90.00
Fineness Modulus of Fine Aggregate	Tex-402-A	each	\$90.00
Saturated Surface-Dry Specific Gravity and Absorption of Aggregates	Tex-403-A	each	\$85.00
Determining Unit Mass (Weight) of Aggregates	Tex-404-A	each	\$75.00
Determining Percent Voids and Solids in Concrete	Tex-405-A	each	\$65.00
Material Finer than 75 micrometer (No. 200) Sieve in Mineral Aggregates (Decantation Test for Concrete Aggregates)	Tex-406-A	each	\$80.00
Organic Impurities in Fine Aggregate for Concrete	Tex-408-A	each	\$80.00
Free Moisture and Water Absorption in Aggregate for Concrete	Tex-409-A	each	\$80.00
Abrasion of Coarse Aggregate Using the Los Angeles Machine	Tex-410-A	each	\$320.00
Soundness of Aggregate Using Sodium Sulfate or Magnesium Sulfate	Tex-411-A	each	\$385.00
Determining Deleterious Material In Mineral Aggregate	Tex-413-A	each	\$100.00
Unit Weight Yield, and Air Content (Gravimetric) of Concrete	Tex-417-A	each	\$75.00
Compressive Strength of Cylindrical Concrete Specimens	Tex-418-A	each	\$30.00
Obtaining and Testing Drilled Cores of Concrete	Tex-424-A	each	\$200.00
Absorption and Dry Bulk Specific Gravity of Lightweight Coarse Aggregate	Tex-433-A	each	\$100.00
Measuring Texture Depth by the Sand Patch Method	Tex-436-A	each	\$100.00
Test Flow of Grout Mixtures (Flow Cone Method)	Tex-437-A	each	\$95.00
Flexural Strength of Concrete Using Simple Beam Third-Point Loading	Tex-448-A	each	\$100.00
Capping Cylindrical Concrete Specimens	Tex-450-A	each	\$30.00
Determining Crushed Face Particle Count	Tex-460-A	each	\$100.00

Unit Costs - Surveying		Consultant Proposal
Services To Be Provided	Unit	Cost
1 - Person Survey Crew	hour	\$115.00
2 - Person Survey Crew	hour	\$165.00
3 - Person Survey Crew	hour	\$190.00

		Consultant Proposal
Other Direct Expenses	Unit	ODE Rate
Mileage	mile	IRS Rate
Construction Truck (Includes operation, and maintenance costs; Insurance costs will not be reimbursed)	month	\$1,500.00
Construction Truck (Includes operation, and maintenance costs; Insurance costs will not be reimbursed)	day	\$ 150.00
Cylinder Molds	each	\$ 3.00
Nuclear Gauge	Trip	\$ 75.00

**ATTACHMENT F
WORK SCHEDULE**

See issued Work Authorizations for Work Schedule.

ATTACHMENT G
COMPUTER GRAPHICS FOR DOCUMENT AND INFORMATION EXCHANGE

Not applicable.

**ATTACHMENT H
SUBCONTRACTING**

The Mobility Authority has established the DBE/HUB participation goal of 3.5% for this Agreement, however the Mobility Authority will review and adjust the goal for each work authorization based on specific project assignments.



CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

December 14, 2022
AGENDA ITEM #10

Discuss and consider approving an amended and restated agreement with Electronic Transaction Consultants, LLC (ETC) for electronic toll collection installation and maintenance services

Strategic Plan Relevance:	Innovation, Service and Stewardship
Department:	Operations
Contact:	Tracie Brown, Director of Operations
Associated Costs:	Not Applicable
Funding Source:	Not Applicable
Action Requested:	Consider and act on draft resolution

Project Description/Background: Electronic Toll Consultants, LLC (ETC) was previously awarded the 2021 RFP for Electronic Toll Collection System (ETCS) Integration and Maintenance Services. The scope of their work in support of the Mobility Authority includes incremental replacement and maintenance of ETCS equipment on all existing Mobility Authority toll projects, as well as implementation and maintenance of systems on new Mobility Authority toll projects.

Action Requested: Staff began working with the ETC project team immediately after the Agreement was executed, participating in multiple workshops to clarify the project scope and requirements. The project team also outlined the sequence in which the Mobility Authority's existing toll systems would be replaced, with the 71 Toll ETCS selected as the first such project. During these discussions, the teams identified several areas of the Agreement that need to be modified to ensure performance. These areas include bonding, revenue assurance, insurance, and Service Level Agreements (SLAs). The proposed amended and restated agreement addresses each of these topics.

Bonding & Revenue Assurance

To ensure adequate protection against loss of revenue incurred by the CTRMA due to acts or omissions of ETC for roads/lanes that are under the supervision and maintenance of ETC, staff recommends amending the Maintenance Performance Bond to include provisions for 60 days of revenue protection as well as requiring a \$10 million guaranty from ETC's parent company. Staff believes that this is adequate to protect the CTRMA from any potential revenue loss due to actions of ETC which might impact CTRMA projects.

Insurance

The following insurance coverage requirements will be provided for:

- Professional Liability: Increase current \$10M requirement to \$40M in coverage as offered by ETC
- Technology Errors & Omissions: Add \$10M coverage for programming errors or other errors that prevent toll collection
- Cyber/Network Security Liability: Increase current \$10M requirement to \$20M to cover the cost of forensic analysis to remove the virus, notification of affected individuals, etc.
- Employee Theft (aka Crime or Employee Dishonesty policy): Add requirement for \$10M coverage

Additional Modifications

Modifications are also proposed to other areas of the Agreement. These items are outlined below:

- Agreement - Article 7
 - Make conforming and clarifying changes related to revenue loss bond, supplemental nature of coverage, liability in excess of bond/security amounts
- Agreement - Article 13.d.iv
 - Add software escrow language in the event of default or termination
 - Add language that specifies a transfer of hosting environment / data / licenses / access to CTRMA or their designee in the event of default
- Appendix A - Scope of Work
 - Update Section 2.18 - Succession Plan
 - Update technical requirements as agreed to in agency / vendor workshops
- Appendix B - Work Authorization
- Appendix F - SLAs

- Appendices I-K – Forms of Payment & Performance Bonds
 - To align with changes to the revised bonding provisions

The not to exceed amount of \$79,720,455 approved by the Board in December 2021 remains the same.

Previous Actions & Brief History of the Program/Project: In December 2021, the Mobility Authority Board approved the contract with ETC for electronic toll collection integration and maintenance services. The initial term of the agreement is six (6) years with an option for two (2) successive two (2) year renewal terms, subject to the approval of the Mobility Authority’s Board of Directors. The total cost for the agreement is not to exceed \$79,720,455. This amount covers all toll collection system installation and maintenance services for new projects as well as existing projects as they are replaced.

In February 2022, the Executive Director approved WA #1 for design support services on the 183N Mobility Project. The total amount not to exceed for this work was \$287,971.93.

Financing: Various construction and operating accounts

Action requested/Staff Recommendation: Staff recommends the Board approve the amendment to the agreement with Electronic Transaction Consultants, LLC (ETC) for electronic toll collection integration and maintenance services.

Backup provided:
Draft amended and restated agreement
Presentation
Draft Resolution

**GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY**

RESOLUTION NO. 22-0XX

**APPROVING AN AMENDED AND RESTATED AGREEMENT FOR ROADSIDE TOLL
COLLECTION SYSTEM INSTALLATION AND MAINTENANCE SERVICES WITH
ELECTRONIC TRANSACTION CONSULTANTS, LLC**

WHEREAS, by Resolution No. 21-075 dated December 15, 2021, the Central Texas Regional Mobility Authority (Mobility Authority) Board of Directors (Board) approved an Agreement for Roadside Toll Collection System Installation and Maintenance Services with Electronic Transaction Consultants, LLC (ETC) in an amount not to exceed \$79,720,455; and

WHEREAS, the Executive Director and ETC have negotiated an Amended and Restated Agreement for Roadside Toll Collection System Installation and Maintenance Services (the “Amended and Restated Agreement”) to reflect the revision of provisions related to loss of revenue, insurance requirements, and performance standards and with no change to the previously approved not to exceed amount, in the form or substantially the same form attached hereto as Exhibit A; and

WHEREAS, the Executive Director recommends that the Board approve proposed the Amended and Restated Agreement with ETC in the form or substantially the same form attached hereto as Exhibit A.

NOW THEREFORE, BE IT RESOLVED, that the Board hereby authorizes the Executive Director to finalize and execute Amended and Restated Agreement for Roadside Toll Collection System Installation and Maintenance Services with Electronic Transaction Consultants, LLC in the form or substantially the same form attached hereto as Exhibit A.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 14th day of December 2022.

Submitted and reviewed by:

Approved:

James M. Bass
Executive Director

Robert W. Jenkins, Jr.
Chairman, Board of Directors

Exhibit A

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

AMENDED AND RESTATED

AGREEMENT FOR

ROADSIDE TOLL COLLECTION SYSTEM

INSTALLATION AND MAINTENANCE SERVICES

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**CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
AMENDED AND RESTATED AGREEMENT FOR
ROADSIDE TOLL COLLECTION SYSTEM INSTALLATION AND MAINTENANCE
SERVICES**

This Amended and Restated Agreement for Roadside Toll Collection System Installation and Maintenance Services (the “Agreement”) is made and entered into by and between the Central Texas Regional Mobility Authority (the “CTRMA”), a regional mobility authority and a political subdivision of the State of Texas, and Electronic Transaction Consultants, LLC (the “Contractor”), to be effective as of the [__]th day of [____], 202[_] (the “Effective Date”). The purpose of the Agreement is to provide for the implementation of roadside toll collection equipment on one or more CTRMA Projects and potentially projects of other toll authorities, as well as to provide for maintenance services for the roadside toll collection equipment.

WITNESSETH:

The parties acknowledge the following:

WHEREAS, pursuant to that certain Request for Proposals dated March 18, 2020 (the “RFP”), the CTRMA sought to identify and obtain the services of a qualified firm to provide toll collection system installation and maintenance services for the CTRMA, and, potentially, other regional mobility authorities; and

WHEREAS, five (5) firms were shortlisted from a total of six (6) firms that submitted responses setting forth their respective qualifications and proposals for the work; and

WHEREAS, pursuant to Resolution No. 21-075, approved on December 15, 2021, the CTRMA Board of Directors (the “Board”) selected the Contractor as the best value proposer to provide the required services; and

WHEREAS, the Parties executed the Agreement for Roadside Toll Collection System Installation and Maintenance Services, effective December 15, 2021 (the “2021 ETCS Agreement”); and

WHEREAS, the Parties in this instrument desire to amend and restate the 2021 ETCS Agreement in its entirety to reflect the revision of provisions related to loss of revenue, insurance requirements, and performance standards; and

WHEREAS, pursuant to Resolution No. [____], approved on [____], 202[____], the Board authorized the execution of this Agreement; and

WHEREAS, this Agreement has been negotiated and finalized between the parties whereby services will be provided by the Contractor and compensation will be paid by the CTRMA pursuant to the terms hereof.

NOW, THEREFORE, in consideration of the benefits received and realized by the respective parties hereto, the parties do hereby agree as follows:

ARTICLE 1
THE SERVICES

The CTRMA hereby retains the Contractor, as an independent contractor, and the Contractor agrees to provide toll collection system installation and maintenance services to the CTRMA, and possibly other toll authorities upon the terms and conditions provided in this Agreement. The scope of services are described in Appendix “A”, and shall include, but not be limited to: (1) the design and implementation of an electronic toll collection system (“ETCS”) for newly constructed or expanded CTRMA projects and replacement of existing toll collection systems on CTRMA projects (the “Installation Services”); and (2) maintenance of the ETCS (the “Maintenance Services”) (the Installation Services and Maintenance Services, along with other services described in Appendix “A”, are collectively referred to herein as the “Services”). In performing the Services, the Contractor shall comply with the business rules set forth in Appendix “A” (the “Business Rules”) which set for the criteria and conditions for various operational requirements of the ETCS.

The Contractor acknowledges and agrees that the Services provided for herein will be provided to the CTRMA and may also be provided for the benefit of other toll authorities through agreements between the CTRMA and the other entities. All terms related to the performance of the Services hereunder to and for the CTRMA shall apply equally to Services provided to other toll authorities, and the CTRMA shall have the right, without objection from the Contractor, to seek performance hereunder and enforce the terms of this Agreement on its own behalf and on behalf of any other entities receiving the Services provided for herein.

The Contractor shall be expected to operate independently from the CTRMA and without extensive oversight and direction. The Contractor represents and warrants that it shall commit the personnel and resources required to respond promptly and fully to the responsibilities and tasks assigned by the CTRMA throughout the term of the Contractor’s performance of the Services described in this Agreement.

ARTICLE 2
PROSECUTION OF WORK AND COMPENSATION

The CTRMA Board of Directors has established a not to exceed amount of \$79,720,455.00 for this Agreement. In no event will the not to exceed amount be exceeded without prior approval by the CTRMA Board of Directors. No compensation shall be paid for work performed that is not authorized by the CTRMA Executive Director in a written Work Authorization, as described below. Authorization for Contractor to perform the Services, payment of compensation for Contractor’s work, and other aspects of the mutual obligations concerning Contractor’s work and payment therefore are as follows:

2.1 INSTALLATION SERVICES

a. Commencement of Work. The Contractor shall not proceed with any Installation Services until a Work Authorization has been issued pursuant to subsection 2.1.b. below. Each Work Authorization for an existing CTRMA Project shall include a transition plan

within the scope, generally describing a sequence and schedule for replacing and/or installing roadside toll collection equipment on the CTRMA Project.

b. Work Authorizations. Each activity, task, or project related to the Installation Services shall be performed pursuant to a separate Work Authorization, signed by the CTRMA and the Contractor. Work shall be performed in accordance with the scope, schedule, and budget set forth in said Work Authorization. The standard form of Work Authorization is attached hereto as Appendix “B” and made a part hereof. The standard form of Work Authorization may be modified during the term of this Agreement at the direction of the CTRMA or as agreed to by the Parties. No amendment of this Agreement is required if the standard form of Work Authorization is amended.

Upon written (including emailed) request from the CTRMA, the Contractor shall prepare a Work Authorization for a specific task or project, to be submitted for the CTRMA’s approval. A proposed Work Authorization must be submitted within thirty (30) days of receipt of the written (or emailed) request. No work shall begin on the activity until the Work Authorization is approved by the CTRMA’s Executive Director and is fully executed. The basis for payment on each Work Authorization will be stated in the Work Authorization as either (i) a lump sum, which may be paid in multiple milestone payments, or (ii) cost plus, using the Installation Service Unit Prices shown in Appendix “C” and estimated hours calculated based on the labor rates shown in Appendix “E”. In all cases a maximum “not-to-exceed” amount for the work will be identified in the Work Authorization, and in no event will the maximum be exceeded without prior approval by the CTRMA Executive Director.

The assignment and authorization of work, if any, shall be at the sole discretion of the CTRMA.

c. Early Completion Incentives. As an inducement to the Contractor to complete the Installation Services subject to a particular Work Authorization in advance of the original completion deadline, the CTRMA may specify in a Work Authorization an amount to be paid as an early completion incentive, and a methodology for determining when all or a portion of the incentive payment has been earned. If, at the option of the CTRMA, an early completion incentive is made available, the maximum amount thereof shall be reflected in the Work Authorization as part of the not to exceed amount stated therein. The CTRMA is not required to make an early completion incentive available on any project or in any Work Authorization.

d. Delays in Completing Installation Services. It is critical to the financial stability of the CTRMA and essential for the convenience of the traveling public that the performance of Installation Services is carried out in accordance with the schedules set forth in any Work Authorization. Damages for failure to meet a schedule deadline are difficult to estimate, and therefore shall result in liquidated damages being assessed by the CTRMA at a rate specified in the applicable Work Authorization, unless specific time extensions have been requested by the Contractor and approved by the CTRMA, at its sole discretion. The CTRMA reserves the right to deduct the amount of liquidated damages from any funds due the Contractor. If retained funds or other funds due the Contractor are not sufficient to cover the liquidated damages, the Contractor, or surety (as set forth in Article 7) shall promptly pay the amount due. Nothing herein shall preclude the delay in performance from being an event providing for notice and possible

termination under Article 4. Without waiving the foregoing, if at any time during the term of this Agreement the Contractor cannot provide the requested Installation Services within the time required by the CTRMA or for any other reason, the CTRMA may, without waiving any other rights it may have under this Agreement, procure the Installation Services from any other source it deems capable of providing those Installation Services.

e. Adjustment of Installation Services Prices. The initial prices to be used for establishing the Installation Services Unit Prices in any Work Authorization are set forth in Appendix “C” and Appendix “E” and shall be adjusted annually commencing on the second anniversary of this Agreement to account for increases or decreases in the costs of labor and materials from the costs as of the Effective Date. Any increase or decrease in the annual adjustment shall not result in rates increasing or decreasing by more than 5% from the prior years’ adjustment. Notwithstanding the foregoing, the Installation Services Unit Prices in any Work Authorization in effect at the time of an adjustment will not be subject to such adjustment. Price adjustments subject to this subsection 2.1.e. shall be based on the following indices:

i. labor amounts shall be adjusted in accordance with the Consumer Price Index (CPI) for Urban Wage Earners and Clerical Installation Workers for the Austin, Texas metropolitan area (“all items”) as published by the U.S. Department of Labor, Bureau of Labor Statistics.

ii. material amounts shall be adjusted in accordance with the Electrical Machinery and Equipment Index (WPU 117), as published by the U.S. Bureau of Labor Statistics.

2.2 MAINTENANCE SERVICES

a. Commencement of the Maintenance Services. The initiation of the Maintenance Services shall commence with the issuance of a Work Authorization describing the facilities and equipment to be maintained. A Work Authorization for Maintenance Services will not be issued until all requirements under the Work Authorization for Installation Services for the applicable CTRMA Project have been completed to the satisfaction of the CTRMA, and any maintenance service required prior to the issuance of a Work Authorization for Maintenance Services shall be deemed to be part of the requirements of the Installation Services.

b. Fees and Charges. The CTRMA shall pay a monthly fee (the “Monthly Fee”) for the Maintenance Services to be performed using the Maintenance Services Unit Prices set forth in the Appendix “D” and for the equipment and facilities identified therein and, if applicable, the labor rates shown in Appendix “E”. The Monthly Fee shall be adjusted following the Initial Term as provided in subsection 2.2.e.

c. Revisions to Scope of Maintenance Services. Any revision to the scope of the Maintenance Services assigned to the Contractor in accordance with this Agreement, including but not limited to the addition or removal of lanes or segments of CTRMA projects or an adjustment in the price for the Maintenance Services, shall be implemented pursuant to a Supplemental Work Authorization authorized by the CTRMA, which shall also include any changes to the Monthly Fee.

d. Delays in Completing Maintenance Services. It is critical to the financial stability of the CTRMA and essential for the convenience of the traveling public that the performance of Maintenance Services is carried out in accordance with the Service Level Agreements (“SLAs”) set forth in Appendix “F”. Damages for failure to meet a schedule deadline are difficult to estimate, and therefore shall result in liquidated damages being assessed by the CTRMA at a rate specified in the Appendix “F”, unless specific time extensions have been requested by the Contractor and approved by the CTRMA, at its sole discretion. The CTRMA reserves the right to deduct the amount of liquidated damages from any funds due the Contractor. If retained funds or other funds due the Contractor are not sufficient to cover the liquidated damages, the Contractor, or surety (as set forth in Article 7) shall promptly pay the amount due. Nothing herein shall preclude the delay in performance from being an event providing for notice and possible termination under Article 4. Without waiving the foregoing, if at any time during the term of this Agreement the Contractor cannot provide the requested Maintenance Services within the time required by the CTRMA or for any other reason, the CTRMA may, without waiving any other rights it may have under this Agreement, procure the Maintenance Services from any other source it deems capable of providing those Maintenance Services.

e. Adjustment of Maintenance Services Prices. The Monthly Fee shall not be increased or decreased during the Initial Term except for adjustment as a result of adding additional lanes or segments resulting in an increase in fees, or closing existing lanes or segments resulting in a decrease in fees. The initial prices to be used for establishing the Monthly Fee are set forth in Appendix “D” and Appendix “E” and shall be adjusted annually commencing on the second anniversary of this Agreement to account for increases or decreases in the costs of labor and materials from the costs as of the Effective Date. Any increase or decrease in the annual adjustment shall not result in rates increasing or decreasing by more than 5% from the prior years’ adjustment. Price adjustments subject to this subsection 2.2.e. shall be based on the following indices:

i. labor amounts shall be adjusted in accordance with the Consumer Price Index (CPI) for Urban Wage Earners and Clerical Installation Workers for the Austin, Texas metropolitan area (“all items”) as published by the U.S. Department of Labor, Bureau of Labor Statistics.

ii. material amounts shall be adjusted in accordance with the Electrical Machinery and Equipment Index (WPU 117), as published by the U.S. Bureau of Labor Statistics.

2.3 COMPENSATION, GENERALLY

a. EXPENSES. The compensation described above is anticipated by the CTRMA and the Contractor to be full and sufficient compensation and reimbursement for the performance of the Services. The Contractor shall not be entitled to reimbursement from the CTRMA for out of pocket expenses incurred by the Contractor related to the performance of its duties under this Agreement.

b. INVOICES AND RECORDS. The Contractor shall submit a monthly invoice certifying the time sheets reflecting the number of hours worked by Contractor personnel and the costs associated with providing the Services under this Agreement during the previous month, and

shall also present a reconciliation of monthly invoices and the Work Authorization (and related estimates) to which the work relates. Each invoice shall be in such detail as is required by the CTRMA, including a breakdown of Services provided pursuant to specified Work Authorizations and, if applicable, a report reflecting the progress on each SLA subject to the specified Work Authorization. The costs associated with work performed on any Work Authorization will be tracked and reported to the CTRMA separately from other work performed by the Contractor. The monthly invoice to the CTRMA will include a progress summary of the work performed the previous month on each ongoing Work Authorization.

Upon request of the CTRMA, the Contractor shall also submit certified time and expense records and copies of invoices that support the invoiced time and expense figures. In the event that the work performed under this Agreement is subject to federal or state reporting requirements, Contractor shall submit any supporting information required to comply with such reporting requirements not otherwise provided for under this Agreement.

c. **EFFECT OF PAYMENTS.** Payment terms are net thirty (30) days after receipt of an undisputed invoice. No payment by the CTRMA shall relieve the Contractor of its obligation to timely deliver the Services required under this Agreement. If after approving or paying for any Service, product or other deliverable, the CTRMA determines that said Service, product, or deliverable does not satisfy the requirements of this Agreement, the CTRMA may reject the same and, if the Contractor fails to correct, cure, or provide a plan acceptable to the CTRMA for cure within a reasonable period of time, but no later than thirty (30) days after receipt of written notice of the manner in which a Service, product, or deliverable does not satisfy the requirements of this Agreement, and at no additional cost to the CTRMA, the Contractor shall return any compensation received therefore. In addition to all other rights provided in this Agreement, the CTRMA shall have the right to set off any amounts owed by the Contractor pursuant to the terms of this Agreement upon providing the Contractor prior written notice thereof. Disputed amounts are to be resolved pursuant to the dispute resolution process as provided in Article 38 of this Agreement. If it is determined that the CTRMA has wrongfully withheld amounts from payment, the CTRMA shall promptly pay all withheld amounts.

Except to the extent amounts owed may be set off as provided above, the CTRMA shall make timely payments for all undisputed amounts. If any undisputed amounts remain outstanding for more than sixty (60) days, the Contractor retains the right to suspend performance under this Agreement (including but not limited to suspending CTRMA's license to Software) without any further obligation or liability. Contractor's right to suspend performance is subject to first providing a written notice to the CTRMA detailing the undisputed amounts which have been outstanding for more than sixty (60) days. If the CTRMA fails to cure such outstanding undisputed amounts no later than thirty (30) days after receipt of the written notice, Contractor may suspend performance under this Agreement.

d. **TAXES.** The Contractor acknowledges that the CTRMA is a tax-exempt entity under Sections 151.309, et seq., of the Texas Tax Code.

ARTICLE 3
TERM OF AGREEMENT

It is understood and agreed that the initial term of this Agreement shall be a period of six (6) years, commencing on December 15, 2021 and concluding on December 15, 2027, (the “Initial Term”) subject to the earlier termination of this Agreement pursuant to Articles 4 or 5 below or further extension upon agreement of both parties. There shall be two (2) successive two (2) year renewal terms following the expiration of the Initial Term, each of which shall be subject to approval of the CTRMA Board of Directors. In addition to the Initial Term and the renewal terms, the parties may agree to extend the term of this Agreement in order for the Contractor to provide Maintenance Services for a period covering the useful life of the roadside toll collection equipment on CTRMA Projects installed by the Contractor pursuant to this Agreement.

In addition to any termination rights set forth in this Agreement, either party may elect not to extend the term of one or both of the renewal terms by providing one hundred eighty (180) days written notice to the other prior to the end of the then current term. Upon delivery of such written notice, the parties will commence the succession plan, as set forth in Appendix “A”. If at any time during the term of this Agreement the Contractor cannot provide the requested Services within the time required by the CTRMA or for any other reason, the CTRMA may, without waiving any other rights it may have under this Agreement, procure the Services from any other source it deems capable of providing those Services.

ARTICLE 4
TERMINATION FOR DEFAULT

Time is of the essence with respect to the performance and completion of all the Services to be furnished by the Contractor pursuant to Work Authorizations issued and which specify an agreed-upon completion or delivery date. Without limiting the foregoing, the Contractor shall furnish all Services in such a manner and at such times as the CTRMA may require. Except as provided below, should the Contractor at any time (a) not carry out its obligations under this Agreement or (b) not be providing the Services to be rendered hereunder in an expeditious and efficient manner and in full compliance with this Agreement, or if the Contractor shall fail in any manner to discharge any other of its obligations under this Agreement, the CTRMA may, upon providing the Contractor with not less than thirty (30) days prior written notice and opportunity to cure (provided that in no event shall the cure period be more than thirty (30) days from receipt of the written notice unless a plan for a longer cure period is provided by Contractor and approved by the CTRMA in its sole discretion), terminate this Agreement. Notwithstanding the foregoing, the CTRMA may terminate this Agreement by providing not less than five (5) days prior written notice (an no opportunity to cure) in the event the Contractor fails to provide any bond, including the renewal of any bond, pursuant to the requirements under Article 7.

Any such termination under this Article 4 shall not constitute a waiver or release by the CTRMA of any claims for damages, claims for additional costs incurred by the CTRMA to complete and/or correct the work described in this Agreement, or any other claims or actions arising under this Agreement or available at law or equity which it may have against the Contractor for its failure to perform satisfactorily any obligation hereunder, nor shall such termination

pursuant to this Article 4 or Article 5 below abrogate or in any way affect the indemnification obligations of the Contractor set forth in Article 17 hereof.

Contractor has provided the CTRMA with three (3) years of financial statements as part of its Proposal (as defined in Article 20), and has represented that it has experienced positive cash flow during that three (3) year period. Contractor shall have a continuing obligation under this Agreement to notify the CTRMA of: (i) any material adverse change in its financial position or the occurrence of any event which may result in an adverse change (such as claims, litigation, etc.); (ii) the failure to maintain a positive cash flow for any fiscal year during the term of this Agreement; or (iii) any event of insolvency or the initiation of any bankruptcy proceeding or other action seeking protection from creditors or claimants during the term of this Agreement. The failure to provide required notification shall be an event of default for which the CTRMA may terminate this Agreement without the requirement for notice as set forth in the preceding paragraph.

If the CTRMA terminates this Agreement as provided either in this Article 4 or Article 5, no fees of any type, other than fees due and payable as of the termination date pursuant to Article 2 hereof for work performed and acceptable to the CTRMA, shall thereafter be paid to or collected by the Contractor, and the CTRMA shall have a right to offset or otherwise recover any damages incurred by reason of the Contractor's breach hereof, together with the right to offset amounts owed to the Contractor pursuant to Article 7 hereof. In determining the amount of any payments owed to the Contractor, the value of the work performed by the Contractor prior to termination shall be no greater than the value that would result by compensating the Contractor in accordance with Article 2 hereof for all Services performed and expenses reimbursable in accordance with this Agreement.

ARTICLE 5 **OPTIONAL TERMINATION**

In addition to the process for termination described above, this Agreement may also be terminated as follows:

a. **GENERALLY.** The CTRMA has the right to terminate this Agreement at its reasonable option, at any time with or without cause, by providing sixty (60) days written notice of such intention to terminate pursuant to this subsection 5.a. hereof and by stating in said notice the optional termination date. Upon such optional termination, the CTRMA shall enter into a settlement with the Contractor upon an equitable basis as determined by the CTRMA, which shall fix the value of the work performed by the Contractor prior to the optional termination date. In determining the value of the work performed, the CTRMA in all events shall compensate the Contractor for any reasonable costs or expenses actually incurred and which are attributable to the exercise of the CTRMA's optional termination, on an equitable basis as determined by the CTRMA as noted above, provided, however, that no consideration will be given to anticipated profit which the Contractor might possibly have made on the uncompleted portion of the Services.

b. **NO FURTHER RIGHTS, ETC.** Termination of this Agreement and payment of an amount in settlement as described in this Article 5 shall extinguish all rights, duties, obligations, and liabilities of the CTRMA and the Contractor under this Agreement (except those which are

designated as surviving termination, including without limitation the indemnification obligations of Contractor set forth in Article 17), and this Agreement shall be of no further force and effect, provided, however, such termination shall not act to release the Contractor from liability for any previous default, known or unknown, either under this Agreement or under any standard of conduct set by common law or statute.

c. **NO FURTHER COMPENSATION.** If the CTRMA shall terminate this Agreement as provided in this Article 5, no fees of any type, other than fees due and payable as of the optional termination date, shall thereafter be paid to the Contractor, provided that the CTRMA shall not waive any right to damages incurred by reason of the Contractor's breach thereof. The Contractor shall not receive any compensation for Services performed by the Contractor after the optional termination date, and any such Services performed shall be at the sole risk and expense of the Contractor.

ARTICLE 6 **TERMINATION, GENERALLY**

The CTRMA's rights and options to terminate this Agreement, as provided in any provision of this Agreement, shall be in addition to, and not in lieu of, any and all rights, actions, options, and privileges otherwise available under law or equity to the CTRMA by virtue of this Agreement or otherwise. Failure of the CTRMA to exercise any of its said rights, actions, options, and privileges to terminate this Agreement as provided in any provision of this Agreement or otherwise shall not be deemed a waiver of any of said rights, actions, options, or privileges or of any rights, actions, options, or privileges otherwise available under law or equity with respect to any continuing or subsequent breaches of this Agreement or of any other standard of conduct set by common law or statute. Upon notice of termination of this Agreement by either of the parties, and subject to Article 13 hereto, the Contractor shall update and implement the succession plan, as required in Appendix "A" to ensure a smooth, efficient, and uninterrupted transition to any successor contractor or subcontractor.

ARTICLE 7 **SERVICE LEVEL AGREEMENTS AND PERFORMANCE GUARANTY**

a. **SLA NONCOMPLIANCE.** Timely and accurate performance of the Services is critically important to the CTRMA. Contractor has represented that it will perform the Services in a timely and accurate manner, and Contractor acknowledges that the failure to do so will cause material harm to the CTRMA. Without waiving any other rights provided for in this Agreement, the Parties have identified certain SLAs intended to assure that critical aspects of the Services are provided in a timely and reliable manner, and that if they are not that there are consequences for Contractor's failure to perform. The SLAs and a table showing financial consequences for failure to adhere to those SLAs is set for in Appendix "F". In the event Contractor fails to adhere to the standards associated with one or more SLAs, the CTRMA shall notify Contractor of such event of noncompliance and shall be authorized to withhold, or offset, the penalty amount indicated in Appendix "F" from amounts owed to the Contractor for Services performed. Nothing in this Article 7 shall preclude the CTRMA from asserting any other remedies related to the failure to perform in accordance with the SLAs, including without limitation termination pursuant to Article 5.

b. **LOSS OF REVENUE.** Notwithstanding any other provision in this Agreement and whether or not the performance of the Services is in conformance with the requirements specified herein (including the appendices), in the event the CTRMA incurs a loss of revenue due to any action or inaction of the Contractor, the Contractor shall be obligated to make payment to the CTRMA of all lost revenue and other direct damages associated with the loss, including payments made to the CTRMA's third-party vendors. In the event that the CTRMA is unable to determine the amount of lost revenue because data is lost or otherwise unavailable, the Parties agree that lost revenue shall be based on historical figures (e.g., traffic, payments) maintained by the CTRMA. The CTRMA may offset lost revenue and associated damages by reducing the amount of the subsequent Monthly Fee for each impacted toll facility.

c. **NON-REVENUE DAMAGES.** In the event the CTRMA incurs damages due to any action or inaction of the Contractor for its failure to perform satisfactorily any obligation under this Agreement, and which are not subject to subsection 7.b., then the Contractor shall be obligated to make payment to the CTRMA for any costs incurred by the CTRMA to complete and/or correct the work for which the Contractor failed to perform. The CTRMA may offset costs incurred by the CTRMA by reducing the amount of the subsequent Monthly Fee for each impacted toll facility. The maximum amount of payments Contractor is required to pay under this subsection 7.c. shall not exceed \$10,000,000, with such amount being exclusive of any proceeds paid under ETC insurance policies or by the surety on any bonds required by this Agreement..

d. **PAYMENT AND PERFORMANCE BONDS.** The Contractor shall furnish the performance bonds and a payment bonds described in this subsection 7.d (collectively, the "Bonds") in the exact form set forth in the applicable appendix to this Agreement. The Bonds do not serve as the full extent of the Contractor's liabilities under this Agreement but are intended to secure the Contractor's obligations in providing the Services as well as to ensure adequate compensation for loss of revenue incurred by the CTRMA under subsection 7.b.

i. **Surety Financial Requirements.** The Bonds shall be issued by a surety with an A.M. Best and Company rating level of A-minus (A-) or better, Class VIII or better, or as otherwise approved in writing by the CTRMA, in its sole discretion. If any bond previously provided becomes ineffective, or if the surety that provided the bond no longer meets the requirements hereof, the Contractor shall provide a replacement bond in the same form issued by a surety meeting the foregoing requirements, or other assurance satisfactory to the CTRMA in its sole discretion.

ii. **Installation Performance and Payment Bonds.** Upon issuance of each Work Authorization under Article 2, subsection 2.1, the Contractor shall provide, and continuously maintain in place for the benefit of the CTRMA, a performance bond in the form of Appendix "I-1" (a "Installation Performance Bond") and a payment bond in the form of Appendix "I-2" (a "Installation Payment Bond") for the Installation Services covered by each applicable Work Authorization. The Installation Performance Bond and Installation Payment Bond shall each be in an amount of 100% of the relevant Work Authorization cost. If a price is increased in connection with a Work Authorization, the CTRMA may, in its sole discretion require a corresponding proportionate increase in the amount of the applicable Installation Performance Bond and Installation Payment Bond.

The Contractor's obligation to maintain and provide the Installation Performance Bond and Installation Payment Bond with respect to the Installation Services shall continue throughout the term of the applicable Work Authorization, but the CTRMA will accept the Installation Performance Bond and Installation Payment Bond with a stated term of one (1) year with a statement set forth in the applicable bond that it shall be renewable annually in accordance with the surety's customary renewal practices, provided further that it shall be an event of default if a bond is not renewed and there is no replacement bond provided prior to the expiration of the bond. If such an event of default occurs, the CTRMA may terminate this Agreement by providing five (5) days written notice to ETC. The CTRMA will release any individual Installation Performance Bond relating solely to a Work Authorization upon the later of (1) expiration of the applicable warranty period related to such Work Authorization, provided that no outstanding claims are then pending or threatened against the Contractor hereunder, or (2) satisfaction of the conditions required for final acceptance of the Installation Services of the applicable Work Authorization. The CTRMA will release any individual Installation Payment Bond relating solely to a Work Authorization (1) upon receipt of (i) evidence satisfactory to the CTRMA that all persons eligible to file a claim against the bond have been fully paid and (ii) unconditional releases of liens and stop notices from all subcontractors who filed preliminary notice of a claim against the bond, (2) upon expiration of the statutory period for subcontractors to file a claim against the bond if no claims have been filed, or (3) upon satisfaction of the conditions required for final acceptance of the Installation Services of the applicable Work Authorization.

iii. Maintenance Performance and Payment Bonds. As a condition to any final acceptance for each Work Authorization under Article 2, subsection 2.1, and prior to the issuance of the Work Authorization under Article 2, subsection 2.2., the Contractor shall furnish the CTRMA with (a) a Maintenance Performance Bond in the form of Appendix "J-1" (with such modifications as the CTRMA approves in writing, in its sole discretion) (the "Maintenance Performance Bond"), and (b) a Maintenance Payment Bond in the form of Appendix "J-2" (with such modifications as the CTRMA approves in writing, in its sole discretion) (the "Maintenance Payment Bond").

The Maintenance Performance Bond and Maintenance Payment Bond shall each be in an amount equal to (a) 100% of the aggregate two-year cost for the Maintenance Services for the Work Authorization under Article 2, subsection 2.2.a. and any Supplemental Work Authorizations under Article 2, subsection 2.2.c.; and (b) sixty (60) days average of revenue for the prior year for the Project(s) subject to the Work Authorization under Article 2, subsection 2.2.a. and any Supplemental Work Authorizations under Article 2, subsection 2.2.c. If the price of the Maintenance Services or the sixty (60) days average revenue for the prior year is increased in connection with a Supplemental Work Authorization under Article 2, subsection 2.2.c., the Contractor shall provide a corresponding proportionate increase in the amount of the Maintenance Performance Bond and Maintenance Payment Bond. , provided that it shall be an event of default if the bonds reflecting the increased amounts are not provided within ten (10) business days of the date of the Supplemental Work Authorization providing for the increased amount. With respect to clause (b) of the first sentence of this paragraph, the CTRMA shall provide the Contractor each previous year's revenue values in a report sufficiently detailed and reasonably acceptable to the Contractor ("Revenue Report"). Contractor shall provide a new Maintenance Performance Bond

and Maintenance Payment Bond to the CTRMA within ten (10) business days receipt of the Revenue Report.

The Contractor's obligation to maintain and provide the current Maintenance Performance Bond and Maintenance Payment Bond with respect to the Maintenance Services shall continue throughout the term of this Agreement, but the CTRMA will accept the Maintenance Performance Bond and Maintenance Payment Bond with a stated term of at least two (2) years with a statement set forth in the applicable bond that it shall be renewable annually in accordance with the surety's customary renewal practices. Provided that the Contractor has paid the CTRMA any applicable damages, compensation for revenue losses, and any other amounts that are payable to the CTRMA under this Agreement, the Maintenance Performance Bond shall be released upon expiration of the term of this Agreement and after the satisfaction of all conditions required for completion of the Maintenance Services. Upon expiration of the term of this Agreement, the CTRMA will release the Maintenance Payment Bond (i) upon receipt of (A) evidence satisfactory to the CTRMA that all persons eligible to file a claim against the bond have been fully paid and (B) unconditional releases of liens and stop notices from all subcontractors who filed preliminary notice of a claim against the bond, or (ii) upon expiration of the statutory period for subcontractors to file a claim against the bond if no claims have been filed.

e. **CONTRACTOR PARENT GUARANTY.** The Contractor shall provide a Parent Guaranty in the form as attached to this Agreement as Appendix K. The Parent Guaranty shall be in the amount of ten million dollars (\$10,000,000) and applicable only to acts and omissions caused by the Contractor on roadways controlled by the Contractor under the terms provided in the Parent Guaranty. This Parent Guaranty shall be for collection only and of secondary recovery, meaning CTRMA must exhaust all administrative remedies under this Contract against Contractor before pursuing recovery under the Parent Guaranty.

ARTICLE 8 **SUSPENSION OR MODIFICATION OF SERVICES; DELAYS AND DAMAGES**

In addition to the foregoing rights and options to terminate this Agreement, the CTRMA may elect to suspend any portion of the Services of the Contractor hereunder, but not terminate this Agreement, by providing the Contractor with prior written notice to that effect. Thereafter, the suspended Services may be reinstated and resumed in full force and effect upon receipt from the CTRMA of written notice requesting same.

Similarly, the CTRMA may expand, cancel (in whole or part), or otherwise modify any portion of the Services previously assigned to the Contractor in accordance with this Agreement. Such modification may include, but is not limited to, technological advances resulting in the development of equipment, software or any other aspect of the Services that would benefit the CTRMA and is not contemplated under this Agreement. In the event the Services are modified, the Parties shall agree to and execute a Work Authorization and Contractor's compensation shall be adjusted (up or down) based on the rates set forth in Appendices "D" or "E" as applicable. Without limiting the foregoing, the Contractor agrees that no claims for damages or other compensation shall be made by the Contractor for any delays, hindrances or modifications occurring during the progress of any portion of the Services specified in this Agreement as a result of any suspension or modifications occurring during the progress of any portion of the Services

specified in this Agreement. Such delays or hindrances, if any, shall be provided for by an extension of time for such reasonable periods as the CTRMA may decide. It is acknowledged, however, that permitting the Contractor to proceed to complete any Services or any part of them after the originally specified date for completion, or after the date to which the time for completion may have been extended, shall in no way operate as a waiver on the part of the CTRMA or any of its rights herein.

ARTICLE 9
PERSONNEL, EQUIPMENT AND MATERIAL, GENERALLY

Contractor shall provide personnel and equipment as follows:

a. **ADEQUATE PERSONNEL, ETC.** The Contractor shall furnish and maintain, at its own expense, adequate and sufficient personnel (drawn from its own employees or from approved subcontractors) and equipment, in the reasonable opinion of the CTRMA, to perform the Services with due and reasonable diligence customary of a firm providing similar services and enjoying a favorable national reputation, and in all events without delays attributable to the Contractor which have a reasonable likelihood of adversely affecting the progress of others involved with one or more of the Projects. All persons, whether employees of the Contractor or of an approved subcontractor, providing the Services shall be fully licensed to the extent required by their professional discipline associations' codes or otherwise by law.

b. **REMOVAL OF PERSONNEL.** All persons providing the Services, whether employees of the Contractor or of an approved subcontractor, shall have such knowledge and experience as will enable them, in the Contractor's reasonable belief, to perform the duties assigned to them. Any such person who, as determined by the CTRMA in its sole discretion, is incompetent or by his/her conduct becomes detrimental to the provision of the Services shall, upon request of the CTRMA, immediately be removed from the Services. The Contractor shall furnish the CTRMA with a fully qualified candidate for the removed person within thirty (30) days thereafter, provided, however, said candidate shall not begin work under this Agreement unless and until approved by the CTRMA.

c. **CONTRACTOR FURNISHES EQUIPMENT, ETC.** Except as otherwise specified or agreed to by the CTRMA, the Contractor shall furnish all equipment, transportation, supplies, and materials required for its performance of Services under this Agreement.

ARTICLE 10
KEY PERSONNEL

The Contractor acknowledges and agrees that the individual(s) identified on Appendix "G" attached hereto and incorporated herein are key and integral to the satisfactory performance of the Contractor under this Agreement. Throughout the term of this Agreement, the Contractor agrees that the identified individual(s) will remain in charge of the performance of the Services and they shall devote substantial and sufficient time and attention thereto. The death or disability of any such individual, his/her disassociation from the Contractor or the approved subcontractor, or his/her failure or inability to devote sufficient time and attention to the Services shall require the Contractor promptly to replace said individual with a person suitably qualified and otherwise

acceptable to the CTRMA. If such individual has not been replaced by an individual approved by the CTRMA within thirty (30) days of the event requiring replacement, Contractor acknowledges that the CTRMA will suffer significant and substantial additional losses due to the unavailability of an approved individual and that it is impracticable and extremely difficult to ascertain and determine the actual losses which would accrue to the CTRMA in such event. Therefore, for each day that an individual identified on Appendix "G" is not filled by an approved individual, the CTRMA may require that the Contractor pay a daily liquidated amount with such amount calculated pursuant to the formula shown in Appendix "G".

ARTICLE 11
BUSINESS OPPORTUNITY PROGRAM AND POLICY COMPLIANCE

Contractor acknowledges that the CTRMA has a Business Opportunity Program and Policy ("BOPP") with which it requires contractors to comply in connection with Disadvantaged Business Enterprises. To the extent the Contractor utilizes third parties to provide the Services hereunder, Contractor agrees to comply with the BOPP and observe the guidelines set forth therein. Contractor shall provide annual reporting to the CTRMA (beginning one (1) year from the Effective Date) regarding its utilization of disadvantaged business enterprises ("DBEs") and the manner in which such utilization complies with, or deviates from, Contractor's commitment to DBE utilization as reflected in its response to the RFP attached as Appendix "H".

ARTICLE 12
PLANNING AND PERFORMANCE REVIEWS; INSPECTIONS

As directed by the CTRMA, key personnel shall meet with the CTRMA's Executive Director and/or his designee(s) upon request to: (a) assess the Contractor's performance of the Services; and (b) plan staffing levels to be provided by the Contractor to the CTRMA for the upcoming calendar quarter. The Contractor shall permit inspections of its Services and work by the CTRMA or its designated representative, when requested by the CTRMA. Nothing contained in this Agreement shall prevent the CTRMA from scheduling such other planning and performance reviews with the Contractor or inspections as the CTRMA determines necessary.

ARTICLE 13
OWNERSHIP OF REPORTS

Ownership of reports and related materials prepared by Contractor (or any subcontractor) at the direction of the CTRMA shall be as follows:

a. **GENERALLY.** Excluding Contractor's ownership rights as provided in Article 13.d., all of the documents, reports, plans, computer records, software maintenance records, discs and tapes, proposals, sketches, diagrams, charts, calculations, correspondence, memoranda, opinions, testing reports, photographs, drawings, analyses and other data and materials, and any part thereof, created, compiled or to be compiled by or on behalf of the Contractor solely under this Agreement ("work product"), including all information prepared for or posted on the CTRMA's website and together with all materials and data furnished to it by the CTRMA, shall at all times be and remain the property of the CTRMA and, for a period of four (4) years from completion of the Services or such period as is required by Texas law, whichever is longer, if at

any time demand be made by the CTRMA for any of the above materials, records, and documents, whether after termination of this Agreement or otherwise, such shall be turned over to the CTRMA without delay. The CTRMA hereby grants the Contractor a revocable license to retain and utilize the foregoing materials, said license to terminate and expire upon the earlier to occur of (a) the completion of Services described in this Agreement or (b) the termination of this Agreement, at which time the Contractor shall deliver to the CTRMA all such materials and documents. If the Contractor or a subcontractor desires later to use any of the data generated or obtained by it in connection with the Projects or any other portion of the work product resulting from the Services, it shall secure the prior written approval of the CTRMA. Notwithstanding anything contained herein to the contrary, the Contractor shall have the right to retain a copy of the above materials, records, and documents for its archives.

b. **SEPARATE ASSIGNMENT.** If for any reason the agreement of the CTRMA and the Contractor set forth in subsection 13.a. above regarding the ownership of work product and other materials is determined to be unenforceable, either in whole or in part, the Contractor hereby assigns and agrees to assign to the CTRMA all right, title, and interest that Contractor may have or at any time acquire in said work product and other materials which are prepared for this Agreement, without royalty, fee or other consideration of any sort, and without regard to whether this Agreement has terminated or remains in force. The CTRMA hereby acknowledges, however, that all documents and other work product provided by the Contractor to the CTRMA and resulting from the Services performed under this Agreement are intended by the Contractor solely for the use for which they were originally prepared. Notwithstanding anything contained herein to the contrary, the Contractor shall have no liability for the use by the CTRMA of any work product generated by the Contractor under this Agreement on any project other than for the specific purpose and Project for which the work product was prepared. Any other reuse of such work product without the prior written consent of the Contractor shall be at the sole risk of the CTRMA.

c. **DEVELOPMENT OF CONTRACTOR WORK PRODUCT.** The CTRMA acknowledges that the Contractor's work product will be developed using data that is available at the time of the execution of a given Work Authorization, and will not constitute any guarantee or other assurance of future events. The Contractor will prepare work product using practices that are standard procedures in the industry.

d. **OWNERSHIP OF MATERIALS, SOFTWARE AND LICENSES.** The CTRMA acknowledges and agrees that, the Contractor and/or its subcontractors or licensors of are the exclusive owners all copyrights, trade secret rights and related intellectual property rights (such rights together referred to herein as "Intellectual Property Rights") in all software and accompanying documentation developed, produced or implemented in connection with this Agreement by the Contractor, its officers, employees, subcontractors or agents (the "Software"). Except as expressly stated herein, this Agreement does not grant the CTRMA any rights in or to such Intellectual Property Rights. The Contractor reserves the right to grant licenses to use such Software to any other party or parties, provided that any such licenses do not affect the provision of any of the Services to the CTRMA pursuant to this Agreement.

i. The provisions of this subsection 13.d. shall be without prejudice to, and shall not interfere with the CTRMA's ownership of reports as provided for under subsections 13.a to 13.c. of this Agreement.

ii. The Contractor reserves all rights in Software and all Intellectual Property associated therewith that have not been expressly granted herein.

iii. For the duration of this Agreement, the Contractor hereby grants to the CTRMA a nonexclusive, non-sublicensable, non-transferable license to use the Software for such purposes and to the extent necessary to enable the CTRMA to receive the Contractor's Services under this Agreement. Notwithstanding anything to the contrary in this Agreement, the license referred to in this sub-clause (iii) shall not survive termination or expiration of this Agreement (except as required to facilitate succession to a new provider). Provided however that the license referred to in this sub-clause (iii) shall be extended for the limited purposes and term that may be necessary to give effect to any post termination or post expiration transition related obligations expressly undertaken by the Contractor under this Agreement, such that Contractor's Services shall remain continuous and uninterrupted for the duration of any post termination or post expiration transition period under this Agreement, with Contractor providing the CTRMA with all permissions and licenses necessary to enable the CTRMA to receive Contractor's Services throughout any such transition period, including permissions and licenses necessary for use of any third-party software implemented by Contractor under this Agreement.

iv. The CTRMA shall have no right to access or use the source code of the Software. Notwithstanding the foregoing, with respect to any contract between the Contractor and any cloud service hosting provider related to the provision of the Services, the Contractor shall grant the CTRMA, upon termination or expiration of this Agreement, all of the rights and privileges of such contract, including but not limited to the CTRMA's right to secure the cloud service hosting services directly from the cloud service hosting provider.

v. The CTRMA shall not attempt to make any part of the Software or any accompanying documentation supplied by the Contractor along with the Software, available to any third party, or otherwise allow access to the same to any third party except as required by law.

vi. The CTRMA shall not attempt to reverse compile, decompile, disassemble or reverse engineer the Software, nor shall it amalgamate, amend, incorporate, modify, reproduce, translate or otherwise alter the same into or with any other software or use the same in conjunction with any third party's software.

vii. For purposes of this Agreement, the term Software shall mean any software used by the Contractor or any subcontractor of the Contractor to provide the Services to the CTRMA, including any software owned or provided by the Contractor or by a sub-consultant of the Contractor.

ARTICLE 14 **SUBLETTING OF WORK**

The Contractor shall not sublet, assign, or transfer any part of the work or obligations included in this Agreement without the prior written approval of the CTRMA. Responsibility for sublet, assigned or transferred work shall remain in all instances with the Contractor.

ARTICLE 15
APPEARANCE AS WITNESS AND ATTENDANCE AT MEETINGS

Contractor shall cooperate with the CTRMA and requests for attendance at meetings and in various types of proceedings as follows:

a. **WITNESS**. If requested by the CTRMA, the Contractor shall prepare such exhibits as may be requested for all hearings and trials related to any of the Services provided under this Agreement.

b. **MEETINGS**. At the request of the CTRMA, the Contractor shall provide appropriate personnel for conferences at its offices, or attend meetings and conferences at (a) the various offices of the CTRMA, (b) the offices of the CTRMA's legal counsel, bond counsel, and/or financial advisors, or (c) any reasonably convenient location.

ARTICLE 16
**COMPLIANCE WITH LAWS AND AUTHORITY POLICIES; PROTECTION OF
DATA AND INFORMATION**

The Contractor shall comply with all federal, state, and local laws, statutes, ordinances, rules, regulations, codes and with the orders, judgements, and decrees of any courts or administrative bodies or tribunals in any matter affecting the performance under this Agreement, including, without limitation, workers' compensation laws, antidiscrimination laws, environmental laws, minimum and maximum salary and wage statutes and regulations, health and safety codes, licensing laws and regulations, the CTRMA's enabling legislation (Chapter 370 of the Texas Transportation Code), other applicable portions of the Texas Transportation Code, and all amendments and modifications to any of the foregoing, if any. The Contractor shall also comply with the CTRMA's policies and procedures provided to the Contractor or which are generally available to the public related to operational and administrative matters, such as, but not limited to, security of and access to the CTRMA information and facilities. When requested, the Contractor shall furnish the CTRMA with satisfactory proof of compliance with said laws, statutes, ordinances, rules, regulations, codes, orders, judgements, and decrees above specified.

As part of their operations, the CTRMA, and other toll authorities to whom services may be provided collect and maintain information about individuals (including toll customers, vehicle owners, and employees) that may include data such as a license-plate number, geolocation or travel data, employment-related information, or login and password credentials (all such data pertaining to individuals, whether or not specifically listed, being "Personal Information"). As part of its performance of the Services, Contractor may have access to, handle, or receive Personal Information or other confidential or proprietary materials, information, or data maintained by or concerning the CTRMA, and other toll authorities to whom services may be provided (collectively with Personal Information, "RMA Information"). Contractor therefore agrees that:

a. Contractor is responsible for the security of RMA Information that it receives or accesses in performing Services, and Contractor shall at all times maintain appropriate information-security measures with respect to RMA Information in a manner consistent with applicable law.

b. Contractor must implement and maintain current and appropriate administrative, technical, and physical safeguards with respect to RMA Information in its possession, custody, or control, or to which it has access, to protect against unauthorized access or use of such RMA Information. At a minimum, such safeguards shall be consistent with generally-recognized best practices for information security in the handling of similar types of data. Without limiting the foregoing, Contractor must appropriately and effectively encrypt RMA Information (i) transmitted over the Internet, other public networks, or wireless networks, and (ii) stored on laptops, tablets, or any other removable or portable media or devices.

c. Contractor must identify to the CTRMA all subcontractors, consultants, and other persons who may have access to RMA Information in connection with the Services. Contractor must restrict the RMA Information to which a given employee or approved subcontractor has access to only that RMA Information which such employee or approved subcontractor needs to access in the course of such employee's or approved subcontractor's duties and responsibilities in connection with the Services.

d. Before granting access to RMA Information, Contractor must ensure that its employees and each approved subcontractor agrees to abide by these information security measures (or other applicable measures that are at least as protective of RMA Information).

e. Absent the CTRMA's advance written permission, RMA Information must not be stored, accessed, or processed at any location outside of the United States.

f. Contractor may use RMA Information only for performing the Services, and Contractor must ensure that its employees and approved subcontractor are restricted from any use of RMA Information other than for such purpose.

g. Except to the extent otherwise expressly permitted, Contractor may not disclose RMA Information except as required by law or a governmental authority having jurisdiction over Contractor. In the event of such required disclosure, Contractor must notify the CTRMA in advance (if legally permissible to do so) and reasonably cooperate with any decision by the CTRMA to seek to condition, minimize the extent of, or oppose such disclosure.

h. Contractor will immediately notify the CTRMA if Contractor discovers any actual or reasonably suspected breach of security or unauthorized use of RMA Information (i) in the possession, custody, or control of Contractor, its employees, or its subcontractors and/or (ii) effectuated using access permissions or credentials extended to an employee or subcontractor of Contractor (either of occurrences (i) or (ii) being referred to as a "Security Incident"). In no event shall Contractor's notification to the CTRMA be later than three (3) days after Contractor discovers the Security Incident; provided, however, that more immediate notification shall be given as the circumstances warrant or if more immediate notification is required by law. Contractor must provide all necessary and reasonable cooperation with respect to the investigation of such Security Incident, including the exchange of pertinent details (such as log files). In addition, Contractor must promptly undertake appropriate remediation measures and inform the CTRMA regarding the same.

i. Subject to requirements of data security or privacy laws, the CTRMA, in its sole discretion, will determine whether, and when to provide notice of a Security Incident to (a) any individuals whose personal information has been actually or potentially compromised; (b) any governmental authority; and/or (c) any other entity, including, but not limited to, consumer credit reporting agencies or the media. All notices must be approved by the CTRMA before they are distributed. Contractor must reimburse the CTRMA for costs or expenses the CTRMA incurs in connection with such notices (including the provision of credit monitoring or other identity protection services, to the extent the provision of such services is legally required or customary for similar data security incidents). Furthermore, and in addition to any other indemnification requirements under this Agreement, Contractor shall indemnify and hold the CTRMA harmless from all claims, costs, expenses, and damages (including reasonable attorneys' fees) that the CTRMA incurs in connection with any regulatory action or third-party claim arising from a Security Incident.

j. Contractor must cooperate and permit the CTRMA (and any governmental authorities with jurisdiction in connection with an audit requested by the CTRMA) reasonable access for on-site review of Contractor's data security systems and procedures to verify Contractor's compliance with its obligations under this Addendum.

k. Contractor must provide a "SOC 1 Type 2" Report or a SOC 1 readiness assessment within two hundred seventy (270) days of the Effective Date, and a SOC 1 Type 2 Report for all subsequent submittals required under this subsection 16.k. Submittals under this subsection 16.k shall be performed by a U.S. audit firm, approved by the CTRMA, in accordance with the American Institute of Certified Public Accountants (AICPA) Professional Standards AT-C Section 320. The scope of each report must include all of Contractor's applications and systems that have access to or are involved in the processing of RMA Information, and each report must include a list of the controls that were tested.

The final audited SOC 1 Type 2 Report must be delivered to the CTRMA no later than May 31st of the then current year, covering the period of April 1 (of the prior year) through March 31 (of the current year). A bridge letter must be delivered to the CTRMA no later than June 30th of the then current year, covering the period April 1 (of the current year) through June 30 (of the current year), which will include a representation from Contractor about changes to the SOC 1 Type 2 controls, including information about changes in the design or effectiveness of the controls.

The CTRMA must approve (i) the planned control objectives prior to commencement of the first SOC 1 Type 2 report and (ii) any planned changes to the scope or timing of the SOC 1 Type 2. Contractor shall notify the CTRMA of any potential report qualification(s) of the audit opinion as soon as practicable but no later than ten (10) business days prior to delivery of the final SOC 1 Type 2 report.

l. Whenever RMA Information is no longer needed for the performance of Services, or at any time upon written notification from the CTRMA, Contractor must unconditionally and without any charge or fee return or, at the CTRMA's written election, certify the secure destruction of, all RMA Information in Contractor's possession, custody, or control (including RMA

Information in the possession, custody, or control of any of Contractor's subcontractors or consultants).

m. Contractor must cooperate and permit the CTRMA's back office service provider reasonable access to all RMA Information in Contractor's possession, custody, or control (including RMA Information in the possession, custody, or control of any of Contractor's subcontractors or consultants) in connection with any PCI DSS compliance audits.

ARTICLE 17 **AUTHORITY INDEMNIFIED**

THE CONTRACTOR SHALL INDEMNIFY AND SAVE HARMLESS THE CTRMA AND ITS OFFICERS, DIRECTORS, EMPLOYEES, AGENTS, AND CONTRACTORS FROM ANY CLAIMS, COSTS OR LIABILITIES OF ANY TYPE OR NATURE AND BY OR TO ANY PERSONS WHOMSOEVER, ARISING FROM THE CONTRACTOR'S ACTS, ERRORS OR OMISSIONS WITH RESPECT TO THE CONTRACTOR'S PERFORMANCE OF THE WORK TO BE ACCOMPLISHED UNDER THIS AGREEMENT, WHETHER SUCH CLAIM OR LIABILITY IS BASED IN CONTRACT, TORT OR STRICT LIABILITY. IN SUCH EVENT, THE CONTRACTOR SHALL ALSO INDEMNIFY AND SAVE HARMLESS THE CTRMA, ITS OFFICERS, DIRECTORS, EMPLOYEES, AGENTS, AND CONTRACTORS (COLLECTIVELY THE "INDEMNIFIED PARTIES") FROM ANY AND ALL EXPENSES, INCLUDING REASONABLE ATTORNEYS' FEES, INCURRED BY THE CTRMA OR ANY OF THE INDEMNIFIED PARTIES IN LITIGATING OR OTHERWISE RESISTING SAID CLAIMS, COSTS OR LIABILITIES. IN THE EVENT THE CTRMA, ITS OFFICERS, DIRECTORS, EMPLOYEES, AGENTS, OR CONTRACTORS IS/ARE FOUND TO BE PARTIALLY AT FAULT, THE CONTRACTOR SHALL, NEVERTHELESS, INDEMNIFY THE CTRMA OR ANY OF THE INDEMNIFIED PARTIES FROM AND AGAINST THE PERCENTAGE OF FAULT ATTRIBUTABLE TO THE CONTRACTOR, ITS OFFICERS, DIRECTORS, EMPLOYEES, AGENTS, SUB CONSULTANTS, AND CONTRACTORS OR TO THEIR CONDUCT.

ARTICLE 18 **CONFLICTS OF INTEREST**

The Contractor represents and warrants to the CTRMA, as of the effective date of this Agreement and throughout the term hereof, that it, its employees and subcontractors (a) have no financial or other beneficial interest in any contractor, engineer, product or service evaluated or recommended by the Contractor, except as expressly disclosed in writing to the CTRMA, (b) shall discharge their responsibilities under this Agreement professionally, impartially and independently, and (c) are under no contractual or other restriction or obligation, the compliance with which is inconsistent with the execution of this Agreement or the performance of their respective obligations hereunder. In the event that a firm (individually or as a member of a consortium) submits a proposal to work for the CTRMA, the Contractor shall comply with the CTRMA's conflict of interest policies and shall make disclosures as if it were one of the key personnel designated under such policies.

ARTICLE 19 INSURANCE

Prior to beginning the Services designated in this Agreement, the Contractor shall obtain and furnish certificates to the CTRMA for the following minimum amounts of insurance:

a. **WORKERS' COMPENSATION INSURANCE.** In accordance with the laws of the State of Texas covering all of Contractor's employees and employer's liability coverage with a limit of not less than \$1,000,000. A "Waiver of Subrogation" in favor of the CTRMA shall be provided.

b. **COMMERCIAL GENERAL LIABILITY INSURANCE.** On an "occurrence basis" with limit a limit of not less than \$1,000,000 combined single limit per occurrence for bodily injury, including those resulting in death; and property damage on an "occurrence basis" with an aggregate limit of not less than \$2,000,000. A "Waiver of Subrogation" in favor of the CTRMA shall be provided.

c. **BUSINESS AUTOMOBILE LIABILITY INSURANCE.** Applying to owned, non-owned, and hired automobiles in an amount not less than \$1,000,000 for bodily injury, including death, to anyone person, and for property damage on account of anyone occurrence. The policy shall insure any vehicle used in connection with the Contractor's obligations under this Agreement. A "Waiver of Subrogation" in favor of the CTRMA shall be provided.

d. **VALUABLE PAPERS INSURANCE.** With limits not less than \$500,000 to cover the full restoration of any records, information, logs, reports, diaries, or other similar data or materials of Contractor relating to the Services provided under this Agreement in the event of their loss or destruction, until such time as the work has been delivered to the CTRMA or otherwise completed.

e. **PROFESSIONAL/CYBERSECURITY INSURANCE.** Professional errors and omissions liability insurance, including liability for financial loss and/or business interruption suffered by the CTRMA, due to error, omission, negligence of employees and machine malfunction in connection with all Services provided by Contractor, in an amount of at least \$40,000,000;

Technology cyber liability insurance, including liability for financial loss and/or business interruption suffered by the CTRMA, due to cyber liability/network security/privacy coverage arising from errors, omission, negligence of employees and hardware malfunction, or causing electronic data to be inaccessible, computer viruses, denial of service, loss of service, network risks (such as data breaches, unauthorized access or use, identity theft, invasion of privacy, damage/loss/theft of data, degradation, downtime, etc.) in connection with all Services provided by Contractor, in an amount of at least twenty million dollars (\$20,000,000), and which has no exclusion or restriction for encrypted or unencrypted portable devices.

f. **EXCESS UMBRELLA LIABILITY.** With minimum limits of \$6,000,000 per claim and in the aggregate, annually, as applicable excess of the underlying policies required at a. - c. above. The Umbrella Policy shall contain the provision that it will continue in force as an underlying insurance in the event of exhaustion of underlying aggregate policy limits.

g. **EMPLOYEE DISHONESTY INSURANCE.** Coverage for employee dishonesty, loss of money and other property belonging to the CTRMA resulting directly from a fraudulent or

dishonest act by an agent or employee of the Contractor while performing the Services, with limits of not less than \$10,000,000 per claim.

h. **GENERAL FOR ALL INSURANCE.** The Contractor shall promptly, upon execution of this Agreement, furnish certificates of insurance to the CTRMA indicating compliance with the above requirements. Certificates shall indicate the name of the insured, the name of the insurance company, the name of the agency/agent, the policy number, the term of coverage, and the limits of coverage.

All policies are to be written through companies (a) registered to do business in the State of Texas; (b) rated: (i), with respect to the companies providing the insurance under subsections 19.a. through e. and 19.g., above, by A. M. Best Company as “A-X” or better (or the equivalent rating by another nationally recognized rating service) and (ii) with respect to the company providing the insurance under subsection 19.f., a rating by A. M. Best Company or similar rating service satisfactory to the CTRMA and/or its insurance consultant; and (c) otherwise acceptable to the CTRMA.

All policies are to be written through companies registered to do business in the State of Texas. Such insurance shall be maintained in full force and effect during the life of this Agreement or for a longer term as may be otherwise provided for hereunder. Insurance furnished under subsections 19.b., c., d., e. f, and g. above, shall name the CTRMA as additional insureds and shall protect the CTRMA, the Contractor, their officers, employees, directors, agents, and representatives from claims for damages for bodily injury and death and for damages to property arising in any manner from the negligent or willful wrongful acts or failures to act by the Contractor, its officers, employees, directors, agents, and representatives in the performance of the Services rendered under this Agreement. Applicable Certificates shall also indicate that the contractual liability assumed in Article 17, above, is included.

The insurance carrier shall include in each of the insurance policies required under subsections 19.a., b., c., d., e., f, and g. the following statement: “This policy will not be canceled or non-renewed during the period of coverage without at least thirty (30) days prior written notice addressed to the Central Texas Regional Mobility Authority, 3300 N. IH 35, Suite 300, Austin, TX 78705, Attention: Executive Director.”

ARTICLE 20 **COORDINATION OF CONTRACT DOCUMENTS**

The Proposal dated June 18, 2021 submitted by the Contractor in response to the RFP and Best and Final Offer, dated October 1, 2021, are attached hereto and incorporated herein as Appendix “H” for all purposes (collectively, the “Proposal”). In the event of a conflict, the order of prevailing precedence (a-highest order to d-lowest order of precedence) shall be as follows:

- (a) Any amendments to the Agreement.
- (b) The Agreement.
- (c) Appendices to the Agreement.

- (d) Work Authorizations Issued by the CTRMA
- (e) The Contractor's Proposal.

However, if the Proposal can reasonably be interpreted as providing higher quality materials or services than those required by the other contract documents or otherwise contains offers, statements or terms more advantageous to the CTRMA, Contractor's obligations under the Agreement shall include compliance with all such statements, offers and terms contained in the Proposal

ARTICLE 21 **MAINTENANCE OF, ACCESS TO, AND AUDIT OF RECORDS**

a. **RETENTION AND AUDIT OF RECORDS.** Contractor shall maintain at its offices in Austin, Texas, a complete set of all books, records, electronic files and other documents prepared or employed by Contractor in its management, scheduling, cost accounting and other activities related to this Agreement. Contractor shall maintain all records and documents relating to this Agreement, including copies of all original documents, or electronic copies of such documents if approved by the CTRMA, delivered to the CTRMA until four (4) years after the date of the termination of this Agreement, or such period as is required by Texas law, whichever is longer. Contractor shall notify the CTRMA where such records and documents are kept. If approved by the CTRMA, photographs, microphotographs or other authentic reproductions may be maintained instead of original records and documents.

Contractor shall make these records and documents available for audit and inspection to the CTRMA, at the CTRMA's offices in Austin, Texas, at all reasonable times, without charge, and shall allow the CTRMA or its representatives to make copies of such documents. The CTRMA may direct its own auditors or representatives to perform such audits or reviews. Contractor shall cooperate fully with the entity performing the audit or review.

Notwithstanding the foregoing, the Contractor shall comply with all laws pertaining to the retention of records and the provision of access thereto. The Contractor shall maintain its books and records in accordance with generally accepted accounting principles in the United States, subject to any exceptions required by existing bond indentures of the CTRMA, and shall provide the CTRMA with a copy of any audit of those books and records as provided herein or otherwise requested by the CTRMA.

b. **PUBLIC INFORMATION ACT.** Contractor acknowledges and agrees that all records, documents, drawings, plans, specifications and other materials in the CTRMA's possession, including materials submitted by Contractor, are subject to the provisions of Chapter 552, Texas Government Code (the "Public Information Act"). Contractor shall be solely responsible for all determinations made by it under such law, and for clearly and prominently marking each and every page or sheet of materials with "Trade Secret" or "Confidential", as it determines to be appropriate. Contractor is advised to contact legal counsel concerning such law and its application to Contractor.

If any of the materials submitted by the Contractor to the CTRMA are clearly and prominently labeled "Trade Secret" or "Confidential" by Contractor, the CTRMA will endeavor

to advise Contractor of any request for the disclosure of such materials prior to making any such disclosure. Under no circumstances, however, will the CTRMA be responsible or liable to Contractor or any other person for the disclosure of any such labeled materials, whether the disclosure is required by law, or court order, or occurs through inadvertence, mistake or negligence on the part of the CTRMA.

In the event of litigation concerning the disclosure of any material marked by Contractor as “Trade Secret” or “Confidential,” the CTRMA’s sole obligation will be as a stakeholder retaining the material until otherwise ordered by a court, and Contractor shall be fully responsible for otherwise prosecuting or defending any action concerning the materials at its sole cost and risk; provided, however, that the CTRMA reserves the right, in its sole discretion, to intervene or participate in the litigation in such manner as it deems necessary or desirable. All costs and fees, including attorneys’ fees and costs, incurred by the CTRMA in connection with any litigation, proceeding or request for disclosure shall be reimbursed and paid by Contractor.

i. Compliance with Subchapter J of the Public Information Act. The requirements of Subchapter J of the Public Information Act may apply to this Agreement, and the Contractor agrees that the Agreement can be terminated if the Contractor knowingly or intentionally fails to comply with a requirement of that subchapter.

Notwithstanding any other provision of the Agreement, within five (5) business days of a request by the CTRMA, the Contractor shall provide any records related to this Agreement that are in the custody or possession of the Contractor that are subject to a pending request for information received by the CTRMA.

Not later than 180 days following the completion of the term of this Agreement, or as specified in the succession plan upon the termination of the Agreement, the Contractor shall provide the CTRMA with all records related to this Agreement in the custody or possession of the Contractor. The cost of complying with this subsection 21.b.i. is not subject to reimbursement by the CTRMA.

ARTICLE 22 **RELATIONSHIP BETWEEN THE PARTIES**

Notwithstanding the anticipated collaboration between the parties hereto, or any other circumstances, the relationship between the CTRMA and the Contractor shall be one of an independent contractor. The Contractor acknowledges and agrees that neither it nor any of its employees or subcontractors, shall be considered an employee of the CTRMA for any purpose. The Contractor shall have no authority to enter into any contract binding upon the CTRMA, or to create any obligation on behalf of the CTRMA. As an independent contractor, neither the Contractor nor its employees shall be entitled to any insurance, pension, or other benefits customarily afforded to employees of the CTRMA. Under no circumstances shall the Contractor, or its employees, or subcontractors, represent to suppliers, contractors or any other parties that it is employed by the CTRMA or serves the CTRMA in any capacity other than as an independent contractor. The Contractor shall clearly inform all suppliers, Contractors and others that it has no authority to bind the CTRMA. Nothing contained in this Agreement shall be deemed or construed to create a partnership or joint venture, to create the relationship of employee-employer or

principal-agent, or to otherwise create any liability for the CTRMA whatsoever with respect to the liabilities, obligations or acts of the Contractor, its employees, subcontractors, or any other person.

ARTICLE 23
DELIVERY OF NOTICES, ETC.

In each instance under this Agreement in which one party is required or permitted to give notice to the other, such notice shall be deemed given either (a) when delivered by hand; (b) one (1) business day after being deposited with a reputable overnight air courier service; or (c) three (3) business days after being mailed by United States mail, registered or certified mail, return receipt requested, and postage prepaid. Any notices provided under this Agreement must be sent or delivered to:

In the case of the Contractor:

Electronic Transaction Consultants, LLC
2600 N. Collins. Blvd, Suite 4000
Richardson, Texas 75080
Attn: General Counsel

In the case of the CTRMA:

Central Texas Regional Mobility Authority
3300 N IH-35, Suite 300
Austin, TX 78705
Attn: Director of Operations

and:

Central Texas Regional Mobility Authority
3300 N IH-35, Suite 300
Austin, TX 78705
Attn: General Counsel

Either party hereto may from time to time change its address for notification purposes by giving the other party prior written notice of the new address and the date upon which it will become effective.

ARTICLE 24
REPORTING OF SUBPOENAS, NOTICES, ETC.

The Contractor shall immediately send the CTRMA a copy of any summons, subpoena, notice, or other documents served upon the Contractor, its agents, employees, subcontractors, or representatives, or received by it or them, in connection with any matter related to the Services under this Agreement.

ARTICLE 25
AUTHORITY'S ACTS

Anything to be done under this Agreement by the CTRMA may be done by such persons, corporations, firms, or other entities as the CTRMA may designate.

ARTICLE 26
LIMITATIONS

Notwithstanding anything herein to the contrary, all covenants and obligations of the CTRMA under this Agreement shall be deemed to be valid covenants and obligations only to the extent authorized by Chapter 370 of the Texas Transportation Code and permitted by the laws and the Constitution of the State of Texas, and no officer, director, or employee of the CTRMA shall have any personal obligations or liability thereunder or hereunder.

The Contractor is obligated to comply with applicable standards of professional care in the performance of the Services. The CTRMA shall have no obligation to verify any information provided to the Contractor by the CTRMA or any other person or entity.

ARTICLE 27
CAPTIONS NOT A PART HEREOF

The captions or subtitles of the several articles, subsections, and divisions of this Agreement are inserted only as a matter of convenience and for reference, and in no way define, limit or describe the scope of this Agreement or the scope or content of any of its articles, subsections, divisions, or other provisions.

ARTICLE 28
CONTROLLING LAW, VENUE

This Agreement shall be governed and construed in accordance with the laws of the State of Texas. The parties hereto acknowledge that venue is proper in Travis County, Texas, for all disputes arising hereunder and waive the right to sue and be sued elsewhere.

ARTICLE 29
COMPLETE AGREEMENT

This Agreement, including all Appendices attached hereto, sets forth the complete agreement between the parties with respect to the Services and supersedes all other agreements (oral or written) with respect thereto. Capitalized terms shall have the definitions provided herein. Any changes in the character, agreement, terms and/or responsibilities of the parties hereto must be enacted through a written amendment. No amendment to this Agreement shall be of any effect unless in writing and executed by the CTRMA and the Contractor. Notwithstanding the foregoing, the Parties acknowledge that the Business Rules contained in Appendix "A", are of a nature that requires continuous revisions throughout the term of this Agreement and that such revisions are not required to be evidenced by a written amendment executed by the Parties. This Agreement may not be orally canceled, changed, modified or amended, and no cancellation, change,

modification or amendment shall be effective or binding, unless in writing and signed by the parties to this Agreement. This provision cannot be waived orally by either party.

ARTICLE 30
TIME OF ESSENCE

With respect to any specific delivery or performance date or other deadline provided hereunder, time is of the essence in the performance of the provisions of this Agreement. The Contractor acknowledges the importance to the CTRMA of the timely provision of the Services and will perform its obligations under this Agreement with all due and reasonable care.

ARTICLE 31
SEVERABILITY

If any provision of this Agreement, or the application thereof to any person or circumstance, is rendered or declared illegal for any reason and shall be invalid or unenforceable, the remainder of this Agreement and the application of such provision to other persons or circumstances shall not be affected thereby but shall be enforced to the greatest extent permitted by applicable law.

ARTICLE 32
AUTHORIZATION

Each party to this Agreement represents to the other that it is fully authorized to enter into this Agreement and to perform its obligations hereunder, and that no waiver, consent, approval, or authorization from any third party is required to be obtained or made in connection with the execution, delivery, or performance of this Agreement.

ARTICLE 33
SUCCESSORS

This Agreement shall be binding upon and inure to the benefit of the CTRMA, the Contractor, and their respective heirs, executors, administrators, successors, and permitted assigns. The Contractor may not assign the Agreement or any portion thereof without the prior written consent of the CTRMA.

ARTICLE 34
INTERPRETATION

No provision of this Agreement shall be construed against or interpreted to the disadvantage of any party by any court, other governmental or judicial authority, or arbiter by reason of such party having or being deemed to have drafted, prepared, structured, or dictated such provision.

ARTICLE 35
BENEFITS INURED

This Agreement is solely for the benefit of the parties hereto and their permitted successors and assigns. Nothing contained in this Agreement is intended to, nor shall be deemed or construed to, create or confer any rights, remedies, or causes of action in or to any other persons or entities, including the public in general. Notwithstanding the foregoing, the Contractor acknowledges that the Services provided for hereunder may be made available to other toll authorities through agreements between the CTRMA and those entities, and that Contractor is required to perform for those entities in a manner which complies with the requirements and obligations of this Agreement. The CTRMA shall have the right to enforce this Agreement against Contractor on behalf of other entities to which the Services are being provided.

ARTICLE 36
SURVIVAL

The parties hereby agree that each of the provisions in the Agreement are important and material and significantly affect the successful conduct of the business of the CTRMA, as well as its reputation and goodwill. Any breach of the terms of this Agreement is a material breach of this Agreement, from which the Contractor may be enjoined and for which the Contractor also shall pay to the CTRMA all damages which arise from said breach. The Contractor understands and acknowledges that the Contractor's responsibilities under Articles 13, 16 and 17 of this Agreement shall continue in full force and effect after the Contractor's contractual relationship with the CTRMA ends for any reason.

ARTICLE 37
FORCE MAJEURE

If a Force Majeure Event occurs, the Nonperforming Party is excused from performance of its obligations under this Agreement but only for the time and to the extent that such performance is prevented by the Force Majeure Event. During a Force Majeure Event that prevents Contractor from delivering Services, Contractor's entitlement to compensation under this Agreement is suspended.

When the Nonperforming Party is able to resume performance of its obligations under this Agreement, it will immediately give the Performing Party (defined below) written notice to that effect and promptly resume performance under this Agreement.

The relief offered by this Force Majeure provision is the exclusive remedy available to the Nonperforming Party with respect to a Force Majeure Event.

The Performing Party may terminate this Agreement if:

- (a) the Nonperforming Party's failure to perform under this Agreement due to a Force Majeure Event impairs material benefits of this Agreement to the other party (the "Performing Party"); and

- (b) the Nonperforming Party does not resume performance in accordance with this Agreement within thirty (30) days following the giving of notice to the Nonperforming Party of the Performing Party’s intent to terminate this Agreement.

In this Agreement, “Force Majeure Event” means any act, event, or condition not foreseeable by a party (the “Nonperforming Party”) that: (A) prevents the Nonperforming Party from performing its obligations under this Agreement; (B) is beyond the control of, not caused in whole or in part by, and not otherwise the fault of the Nonperforming Party; and (C) is not able to be overcome or avoided by the Nonperforming Party’s exercise of diligence or preventative measures. Notwithstanding the foregoing, Force Majeure Events shall be limited to the following: any earthquake, tornado, hurricane, flood or other natural disaster, fire, freight embargo, strike, blockade, rebellion, war, riot, act of sabotage or civil commotion. The following do not constitute a Force Majeure Event: economic hardship, changes in market conditions, or insufficiency of funds.

ARTICLE 38
DISPUTE RESOLUTION

The parties have established an issues resolution ladder in order to resolve disputes expeditiously and effectively at appropriate organizational levels of each party. In the event of any dispute whatsoever arising out of or relating to this Agreement, the disputing party must submit a written notice of the dispute to the Tier 1 designee of the other party shown in the issues resolution ladder below. The notice must state clearly, and in detail, the good faith basis for the dispute. Disputes shall be considered as quickly as possible, taking into consideration the particular circumstances and the time required to prepare detailed documentation. Steps may be omitted as agreed by both parties, and the time periods stated below may be shortened in order to hasten resolution.

Issues Resolution Ladder

<i>Tier</i>	<i>Contractor</i>		<i>CTRMA</i>	<i>Time Limit*</i>
1	Project Manager	and	CTRMA Assistant Director of IT and Toll Systems	10 days
2	Account Vice President	and	CTRMA Director of Operations	10 days
3	Chief Financial Officer	and	CTRMA Executive Director	10 days

** Time (in calendar days) in which dispute must be resolved or passed on to the next tier.*

If a dispute is processed under the issues resolution ladder and not resolved, the parties may attempt to resolve the dispute through mediation, using a mediator mutually agreed upon by the Contractor and the CTRMA, prior to initiating litigation.

At all times during this dispute resolution process or any subsequent administrative, mediation or court proceeding, the Contractor shall proceed with the provision of the Services, without delay, in accordance with this Agreement, and as directed by the CTRMA through a Work Authorization. The Contractor acknowledges that it shall be solely responsible for any delay that results from its actions or inactions during the dispute resolution process, even if the Contractor's position in connection with the dispute ultimately prevails.

ARTICLE 39
CONTRACTOR CERTIFICATIONS

a. **Entities that Boycott Israel.** The Contractor represents and warrants that (1) it does not, and shall not for the duration of this Agreement, boycott Israel or (2) the verification required by Section 2271.002 of the Texas Government Code does not apply to this Agreement. If circumstances relevant to this provision change during the course of the contract, the Contractor shall promptly notify the CTRMA.

b. **Entities that Boycott Energy Companies.** The Contractor represents and warrants that: (1) it does not, and will not for the duration of this Agreement, boycott energy companies or (2) the verification required by Section 2274.002 of the Texas Government Code does not apply to this Agreement. If circumstances relevant to this provision change during the course of this Agreement, the Contractor shall promptly notify the CTRMA.

c. **Entities that Discriminate Against Firearm Entities or Trade Associations.** The Contractor verifies that: (1) it does not, and will not for the duration of this Agreement, have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association or (2) the verification required by Section 2274.002 of the Texas Government Code does not apply to this Agreement. If circumstances relevant to this provision change during the course of this Agreement, the Contractor shall promptly notify the CTRMA.

[Remainder of Page Intentionally Left Blank]

IN WITNESS WHEREOF, the parties have executed this Agreement effective on the date and year first written above.

CONTRACTOR: **ELECTRONIC TRANSACTION CONSULTANTS, LLC**

By: _____
Name: David Mace Roberts
Title: General Counsel and Compliance Officer

CTRMA: **CENTRAL TEXAS REGIONAL MOBILITY
AUTHORITY**

By: _____
Name: James Bass
Title: Executive Director

APPENDIX A
Scope of Services



CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

Restated Agreement – December 14, 2022

**Agreement for
Electronic Toll Collection System
Integration and Maintenance Services**

Appendix 2

Scope of Work

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2 SCOPE OF WORK

The following sections provide information regarding the Scope of Work for the project.

2.1 BACKGROUND

2.1.1 Current Facilities

CTRMA currently operates five (5) All-Electronic Toll (AET) facilities and one (1) Express Lane facility in the Austin area, as shown in Figure 2-1. Historical transaction data for each facility can be found at <https://www.mobilityauthority.com/business/financial/fin-inv-info>. The most recent traffic and revenue projections for each operating facility are included in Appendix 15, Traffic Projections.



Figure 2-1: CTRMA Facility Map

2.1.1.1.1 183A Toll Road

The 183A Toll Road is an 11.6-mile toll road extending from northwest Austin through Cedar Park and Leander in northwest Williamson County (Figure 2-2). The facility consists of tolled mainlines with non-tolled frontage roads at the north end (Figure 2-3). Phase II was completed in 2012, more than seven years ahead of schedule, and plans for Phase III are under development to extend the toll road from its current terminus at Hero Way northward to SH 29.



Figure 2-2: 183A Toll Road Project Map

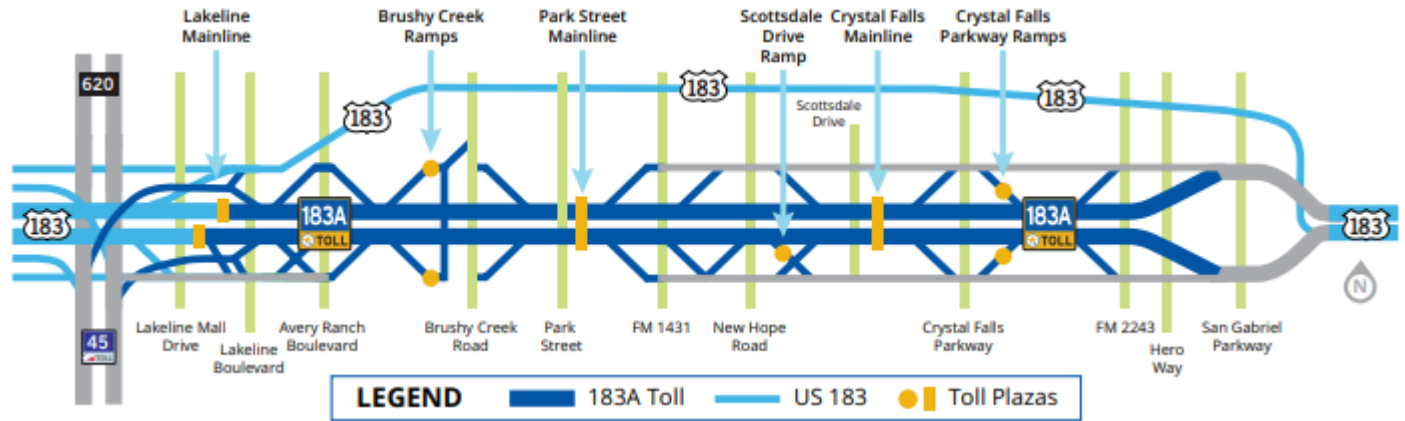


Figure 2-3: 183A Toll Road Project Configuration

2.1.1.2 290 Toll Road

The 290 Toll Road is a 6.2-mile toll road that includes three tolled lanes and three non-tolled general-purpose lanes in each direction from US 183 to the east of Parmer Lane (Figure 2-4). The US 290 facility was upgraded, effectively tripling capacity while preserving the non-tolled lane (Figure 2-5). The 290 toll road links up with important roadways in the region, including US 183 and SH 130, and features a ten-foot-wide, six-mile shared-use path for pedestrians and cyclists.



Figure 2-4: 290 Toll Road Project Map

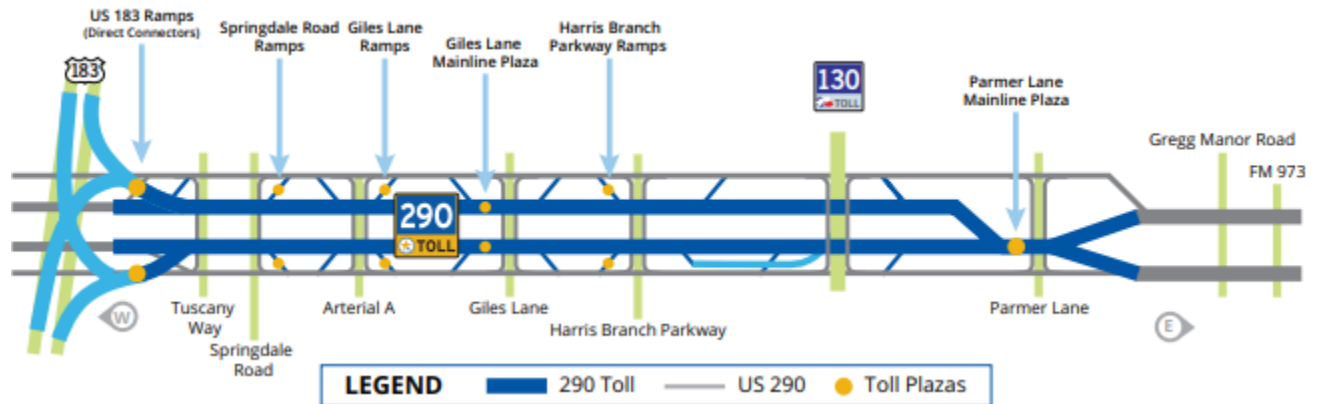


Figure 2-5: 290 Toll Road Project Configuration

2.1.1.3 MoPac Express Lane

The MoPac Express Lane gives drivers the option to bypass congestion on the 11-mile stretch of MoPac between Parmer Lane and Cesar Chavez Street (Figure 2-6). As a primary alternative to I-35, MoPac carries more than 180,000 cars and trucks each day. Estimates project that by 2035, MoPac shall serve more than 220,000 vehicles a day.

The Express Lane is dynamically priced and located in the middle of the MoPac corridor, separated from the existing lanes by a four to five-foot-wide striped buffer zone with flexible plastic sticks. Drivers can access the MoPac Express Lane at Cesar Chavez Street, Far West Boulevard, RM 2222, or Parmer Lane.

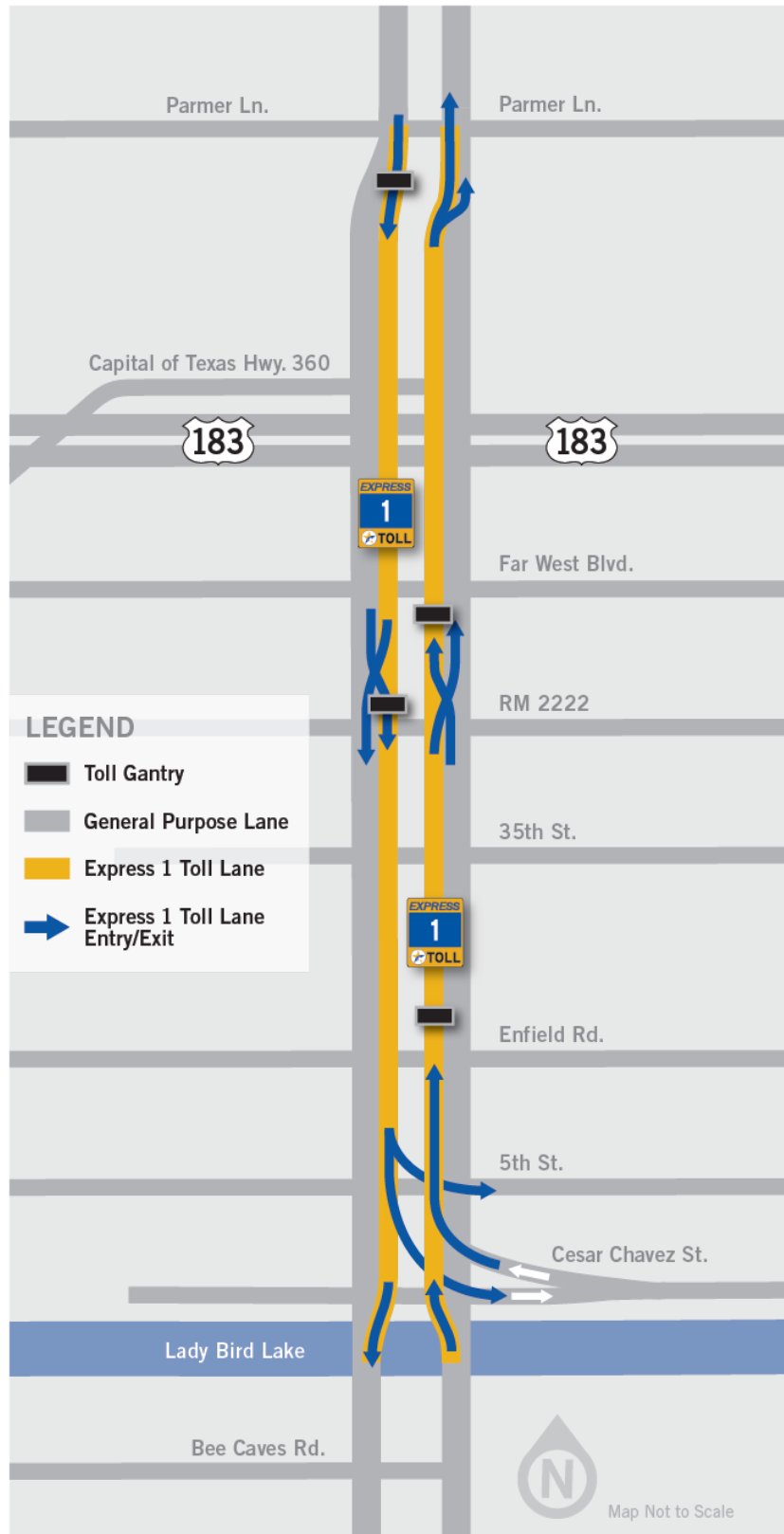


Figure 2-6: MoPac Express Lane Project Map and Configuration

2.1.1.4 71 Toll Lane

The 71 Toll Lane project added a toll lane in each direction alongside of SH 71, beginning at Presidential Boulevard at Austin-Bergstrom International Airport (AUS) and extending east near SH 130 (Figure 2-7). These new lanes offer a free-flowing and reliable bypass route for through-traffic on SH 71, a major corridor connecting drivers to AUS, the city of Bastrop, and beyond.



Figure 2-7: 71 Toll Lane Project Configuration

2.1.1.5 45SW Toll Road

The 45SW Toll Road is a new facility that connects MoPac and FM 1626, bringing relief to the rapidly growing area of southern Travis and northern Hays counties (Figure 2-8). The 45SW Toll Road includes two tolled lanes in each direction (Figure 2-9). The 45SW Toll Road does not contain frontage roads, therefore limiting impacts to the surrounding environment.



Figure 2-8: 45SW Toll Road Project Map



Figure 2-9: 45SW Toll Road Project Configuration

2.1.1.6 183 South Toll Road (North End)

The 183 South project is adding three tolled lanes in each direction on an 8-mile stretch of US 183 between US 290 and SH 71 (Figure 2-10). The northern half of the project between US 290 and Techni Center Drive is now open to traffic (Figure 2-11). Phase II open in January 2021.

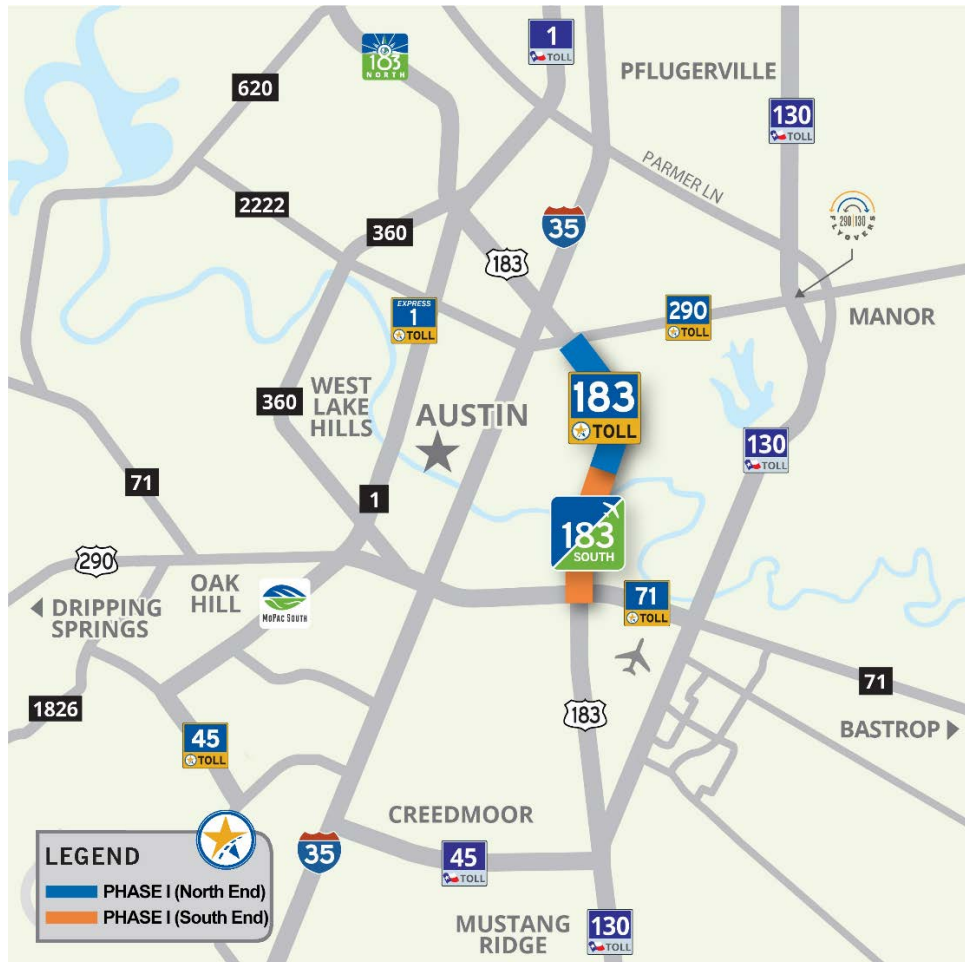


Figure 2-10: 183 South Toll Road (North End) Project Map

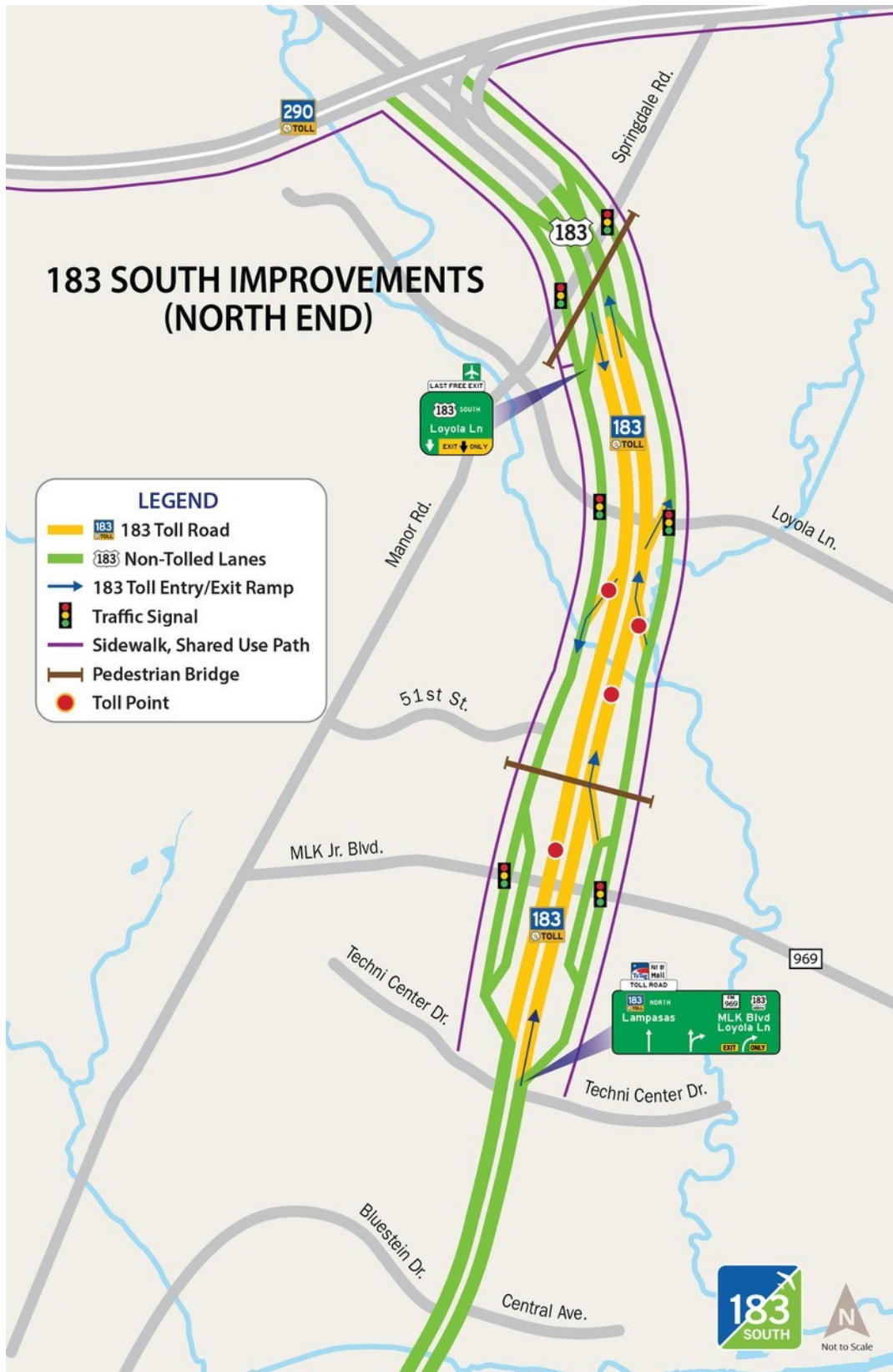


Figure 2-11: 183 South Toll Road (North End) Project Configuration

2.1.1.7 *Traffic Incident and Management Center (TIM Center)*

The TIM Center is located at 104 North Lynnwood Trail in Cedar Park, Texas, and is staffed from 5:30 am to 8 pm during weekdays. The TIM Center has overall responsibility for toll operations and can override pricing and/or open managed lanes to general traffic in accordance with CTRMA. The TIM Center’s operational responsibilities include the following:

1. Facilitate smooth traffic flow
2. Actively monitor real-time traffic and incidents during peak hours
3. Ensure trip building transactions are correct according to the current business rules
4. Provide monitoring and maintenance for roadside equipment

2.1.2 Future Facilities

This section provides information about future CTRMA facilities.

2.1.2.1 *183A Phase III*

CTRMA is proposing to extend 183A north from Hero Way to 1.1 miles north of SH 29 as Phase III of the 183A system (Figure 2-12). The 6.6-mile proposed roadway will have two tolled lanes in each direction with an option to widen to three lanes in the future. The location of the proposed roadway shall be mostly within the median of the US 183 corridor. Schematic design, traffic modeling, and environmental investigations are underway. The extension will also feature a shared-use path north from Hero Way to the proposed Seward Junction Loop project. The project received environmental clearance in August 2019 and is currently undergoing final design. Construction is planned to begin in early 2021.



Figure 2-12: 183A Phase III Study Area

2.1.2.2 183 North

The 183 North Mobility Project (Figure 2-13) includes the construction of two variably priced express lanes in each direction along a 9-mile stretch of US 183 between SH 45/RM 620 and MoPac. This project also includes an additional lane (or lanes as necessary) to bring the number of non-tolled lanes to four in each direction. Express lane direct connectors shall be constructed with MoPac to the south. Construction on this project is scheduled to begin in early 2021.



Figure 2-13: 183 North Project Map

2.1.2.3 MoPac South

The MoPac Expressway south of Cesar Chavez Street is a vital artery in Austin for commuters, neighbors, and visitors (Figure 2-14). This corridor provides a critical link to downtown Austin and other major highways such as US 290 and Loop 360. CTRMA and its partners launched an environmental study in 2013 to analyze the corridor and determine the best approach to managing congestion. The study identified a full range of alternatives, including Express Lane(s), High Occupancy Vehicles Lanes (HOV), Transit Only Lanes, additional General-Purpose Lanes, and Transportation Demand Management Alternatives. The thorough evaluation determined that the Express Lane(s) option was the recommended build alternative because it best met the purpose and need of the study.

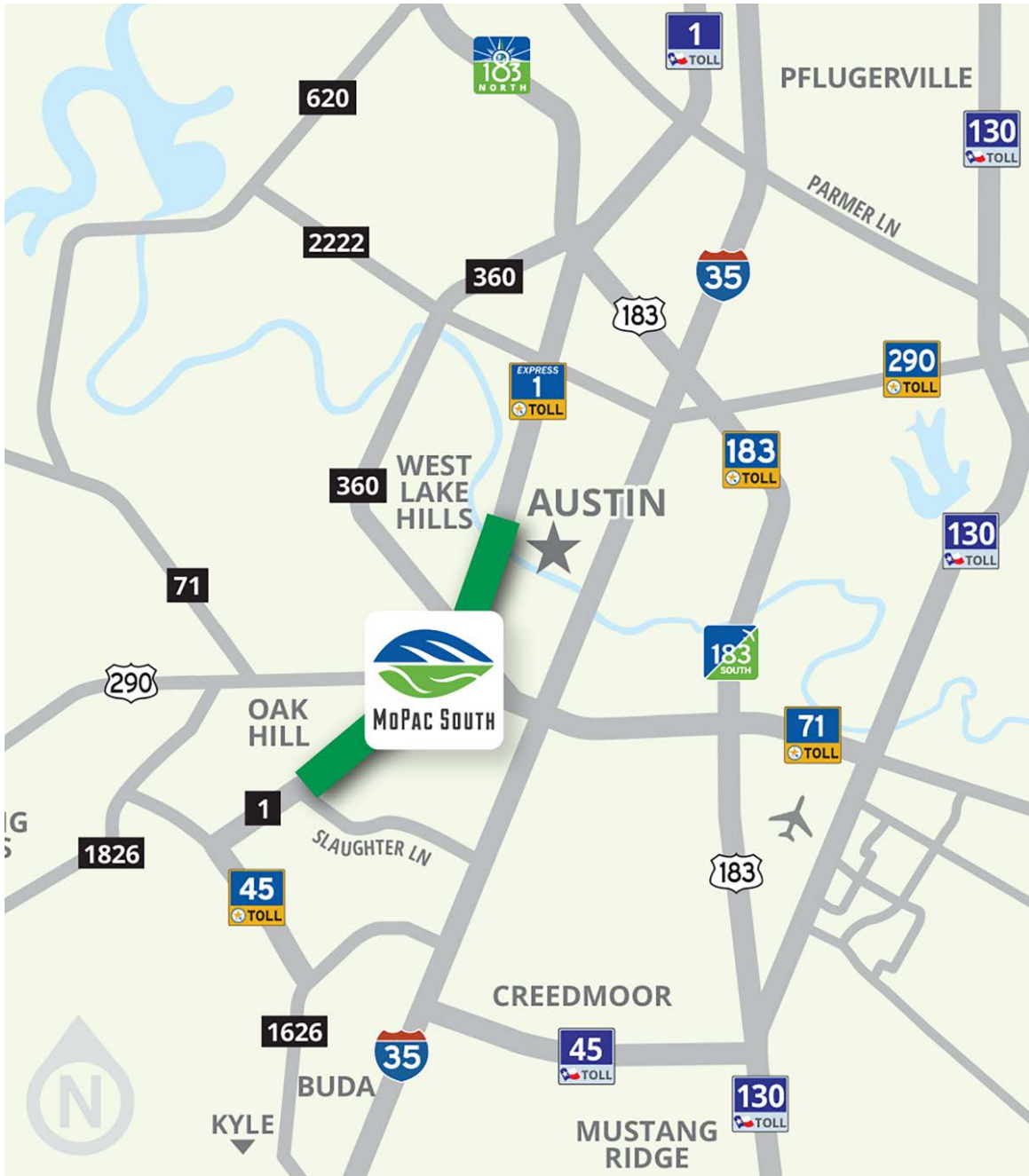


Figure 2-14: MoPac South Project Map

2.1.2.4 290 Toll Phase III

CTRMA, in coordination with TxDOT, has developed plans to construct three direct connectors at the SH 130 interchange (Figure 2-15). These bridges will give drivers a free-flowing direct connection and free up capacity on the frontage road intersection underneath the toll facilities. Construction of three direct connector flyover ramps to link 290 Toll with SH 130 began in late 2018 and is expected to be complete in late 2021, providing a long-term mobility solution for commuters at this intersection.



Figure 2-15: 290 Toll Phase III Project Map

2.2 GENERAL PROJECT INFORMATION

This contract is to provide an ETCS that includes roadside functionality (AVI, AVC, VES, DVAS) and Toll Facility Host (TFH) functionality. The TFH functionality includes trip building, dynamic pricing, image processing, reporting/auditing, and interfaces with other CTRMA third-party systems. The Toll Systems Integrator (TSI) shall be responsible for all aspects of system design, testing, installation/implementation, integration, training, and maintenance of CTRMA's AET and Express Lanes (EL). The ETCS will integrate with CTRMA's Data Platform System (DPS), which connects to CTRMA's Pay By Mail system and the Central US Interoperability (CUSIOP) Hub for away agency processing.

The TSI shall provide an ETCS that includes the following, at a minimum:

1. Roadside systems and infrastructure to support AVI, AVC, VES (cameras), DVAS (cameras), and all related/required components and sensors. Refer to Section 2.2.1, Work Authorization and Project Delivery for more information.
2. Variable Toll Message Signs (VTMS) to display toll rates on Express Lane (EL) facilities.
3. Appropriate applications to support daily operations of CTRMA's facilities.
4. Processing, tracking, and storing all transactions generated by roadside tolling equipment.
5. A trip building system that creates trips based on CTRMA's business rules.
6. Complete image processing to provide license plate information of images captures on the roadside, including all systems, and required operations staff.
7. A dynamic pricing system that calculates and provides toll rates based on traffic conditions in the Express Lanes and General Purpose (GP) lanes.
8. Communication of toll rates to the Variable Toll Message Signs (VTMS) located on Express Lanes.
9. An interface with CTRMA's DPS for transmission and reconciliation of trips, images, and for receipt of Transponder Validation Lists (TVL) and other files.
10. A comprehensive reporting system.
11. All necessary maintenance services to support all hardware, software, and network on the ETCS.
12. A Maintenance Online Management System (MOMS) that supports configurable alerts/alarms, work order creation, and dashboards.
13. Employ, train, supervise, and schedule the required staff to support CTRMA's TIM Center operation, including actively monitoring traffic flow and incidents, reviewing trip building processes to ensure accuracy, and provide monitoring of express lane roadside equipment.
14. User manuals and training for TSI-provided systems and software.
15. Network administration of all ETCS communications equipment, software, cables, connections, configurations necessary to operate the ETCS.

More detailed requirements for these systems and subsystems are described in Sections 2.4, 2.5, 2.6, and 2.15.

2.2.1 Work Authorization and Project Delivery

Each installation of a new facility or transition of an existing facility will be based on individual Work Authorizations approved by CTRMA. Refer to Sections 2.7, Project Management, 2.8, Installation of New Facilities, and 2.9, Transition of Existing Facilities, for further information.

Each Work Authorization will include, at a minimum, the following:

1. General description of the toll road infrastructure and site
2. General requirements of the ETCS
3. Scope of Work (SOW)
4. ETCS equipment and installation requirements
5. Civil/roadway construction requirements (i.e., work by others)
6. The ETCS project implementation or transition schedule
7. Construction schedule (if required)
8. Coordination and project management requirements
9. Toll facilities responsibility matrix
10. Milestone payment schedule
11. Detailed drawings, diagrams, and other required engineering documents (provided by CTRMA)
12. Price sheet
13. Project-level documentation

Additional project documentation will include the following, as defined in Section 2.7.3.1.2, Project-Level Documentation, and Section 2.11, Project Documentation.

Given the segmentation of work based on individual Work Authorizations, the TSI may only be required to update or amend existing documentation to reflect changes to hardware, software, processes, or requirements to reflect designs and project plans for new or transitioned facilities. CTRMA intends to reduce the amount of unnecessary and repetitious documentation as much as possible.

The Milestone Payment Schedule is based on each Work Authorization. The following examples represent the Milestone Payment Schedule for each phase of work, as described in Transition Phases, Section 9.6

Table 2-1: Milestone Payment Schedule for Phase I Work

Milestone Payment Schedule for Phase I - Includes TFH implementation, first facility transition, and delivery of all program documents			
ID	Payment Milestone	% Paid	Cumulative % Paid
A. Mobilization Applies to Section A Mobilization of Cost Proposal Form			
A-1	Mobilization		

Milestone Payment Schedule for Phase I - Includes TFH implementation, first facility transition, and delivery of all program documents			
ID	Payment Milestone	% Paid	Cumulative % Paid
	- Mobilization (upon Work Authorization approval)	100%	100%
B. Hardware and Equipment Ordering and Installation Applies to Section B System Procurement and Installation of Cost Proposal Form			
Equipment Ordering, Installation, and Testing			
B-1	-Purchased, Received and Verified	10%	10%
	-Start of installation activities	15%	25%
	-Installation activities complete	15%	40%
	-Site Installation Test completed and approved	20%	60%
	-Integration Test completed and approved	20%	80%
	-Operational Acceptance Test completed and approved	20%	100%
C. Project Management, Documentation and Testing Services Applies to Section C Project Management and Testing Services of Cost Proposal Form			
Project Management Documentation Approval			
C-1	- Master Project Schedule	5.0%	5.0%
	- Program Management Plan <i>includes the following</i>		
	- a. Roles and Responsibilities		
	- b. Scope Management Plan		
	- c. Quality Management Plan		
	- d. Communication Management Plan		
	- e. Requirement Management Plan		
	- f. Change Management Plan		
	- g. Configuration Management Plan		
- h. Risk Management Plan			
Design Documentation Approval			
C-2	- Software Development Plan	10.0%	15.0%
	- Requirements Traceability Matrix		
	- Master Test Plan		
	- Interface Control Documents		
	- System Detailed Design Documents		

Milestone Payment Schedule for Phase I - Includes TFH implementation, first facility transition, and delivery of all program documents			
ID	Payment Milestone	% Paid	Cumulative % Paid
	- Reports Detailed Design Documents		
	- Data Migration Plan (REMOVED FROM SCOPE OF WORK)		
	- Disaster Recovery Plan		
	- Backup Recovery and Archive Plan		
C-3	Test and Go-Live Planning Documentation		
	- TFH and Roadside Test Plans and Procedures	10.0%	25.0%
	- Installation Plan (for TFH and facility)		
	- Transition Plan (for TFH and facility)		
C-4	Test Results and As-Built Documentation		
	- Test Reports	10%	35.0%
	- As-Built Drawings for transitioned facility		
C-5	Training and maintenance documentation and manuals Approval		
	- Training Plan and Materials	5%	40.0%
	- Roadside System Flow Diagram		
	- MOMs User Manual		
	- Reporting Manual		
	- DVAS Manual		
	- Audit and Reconciliation Manual		
	- Dynamic Pricing and Trips Manual		
	- Maintenance Plan		
	- Initial Inventory (including spares)		
	- Safety plan		
	- Traffic Control Plan		
	- Security Plan		
- Succession Plan			
C-6	TFH FAT completed and approved	10%	50.0%
C-7	TFH Integration to CTRMA DPH	5%	55.0%
C-8	TFH SIT completed and approved	10%	65.0%
C-9	Roadside Facility FAT completed and approved	5%	70.0%
C-10	All toll sites commissioned	10%	80.0%

Milestone Payment Schedule for Phase I - Includes TFH implementation, first facility transition, and delivery of all program documents			
ID	Payment Milestone	% Paid	Cumulative % Paid
C-11	Training Completed and Go-Live	10%	90.0%
C-12	OAT for TFH and Facility completed and approved, and Final As-Built drawings representative of any changes made during test and acceptance.	10%	100.0%

Table 2-2: Milestone Payment Schedule for Phase II Work

Milestone Payment Schedule for Phase II - Includes each transitioned or new facility, project documentation, and program documentation updates			
ID	Payment Milestone	% Paid	Cumulative % Paid
A. Mobilization Applies to Section A Mobilization of Cost Proposal Form			
A-1	Mobilization		
	- Mobilization (upon Work Authorization approval)	100%	100%
B. Hardware and Equipment Ordering and Installation Applies to Section B System Procurement and Installation of Cost Proposal Form			
B-1	Equipment Ordering, Installation, and Testing		
	- Purchased, Received and Verified	10%	10%
	- Start of installation activities	15%	25%
	- Installation activities complete	15%	40%
	- Site Installation Test completed and approved	20%	60%
	- Integration Test completed and approved	20%	80%
	- Operational Acceptance Test completed and approved	20%	100%
C. Project Management, Documentation and Testing Services Applies to Section C Project Management and Testing Services of Cost Proposal Form			
C-1	Project Management Documentation Approval		
	-Work Authorization (Project) Schedule	2.5%	2.5%
	- Project Risk Register		
	- Responsibility Matrix		
	- Updated Roles and Responsibilities		
- Communication Plan			
C-2	Design Documentation Update Approval		
	- Updated Requirements Traceability Matrix	5.0%	7.5%
	- Updated Master Test Plan		
	- Updated Interface Control Documents		
	- Updated System Detailed Design Documents		
	- Updated Reports Detailed Design Documents		
	- Updated Data Migration Plan (REMOVED FROM SCOPE OF WORK)		
- Updated Disaster Recovery Plan			

Milestone Payment Schedule for Phase II			
- Includes each transitioned or new facility, project documentation, and program documentation updates			
ID	Payment Milestone	% Paid	Cumulative % Paid
	- Updated Roadside System Flow Diagram		
	- Updated Backup Recovery and Archive Plan		
Test and Go-Live Planning Documentation Approval			
C-3	- Test Plans and Procedures	5.0%	12.5%
	- Installation Plan (for each new facility)		
	- Transition Plan (for each transitioned facility)		
Test Results and As-Built Documentation			
C-4	Test Reports	5.0%	17.5%
	As-Built Drawings for each transitioned / new facility		
Training, Maintenance documentation and Manual Update Approval			
C-5	- Updated Training Plan and Materials	2.5%	20%
	- Updated Roadside System Flow Diagram		
	- Updated Manuals (to all applicable systems)		
	- Updated Maintenance Plan		
	- Updated Inventory (including spares)		
	- Updated Succession Plan		
C-6	Factory Acceptance Test completed and approved	15%	35%
C-7	Configuration of Toll Facility Host	10%	45%
C-8	Site Installation Test completed and approved	10%	55%
C-9	All toll sites commissioned	15%	70%
C-10	Training Completed / Go-Live (start of revenue collection)	15%	85%
C-11	Operational Acceptance Test completed and approved, and Final As-Built drawings representative of any changes made during test and acceptance.	15%	100%

Table 2-3: Milestone Payment Schedule for Phase III Work

Milestone Payment Schedule for Phase III		
ID	Payment Milestone	Cumulative % Paid
C. Final Documentation		
Applies to Section C Project Management and Testing Services of Cost Proposal Form		
C-60	Test Reports (Test Reports have been approved)	100%
	As-Built Drawings representative of any changes made during test and acceptance (As-Built Drawings from each Work Authorization have been approved)	
	Transition Plan (Verify the Program Transition Plan has been approved and updated as part of each Work Authorization)	
	Program Documentation updates (Verify the Program Documentation has been updated as part of each Work Authorization)	
	Network Diagram updates (Verify network diagrams have been updated with the as-is for those portions of the network that are within the TSI scope of each work authorization.)	
	Inventory (including spares) (Verify the inventory has been provided to CTRMA.)	

2.3 EXISTING EQUIPMENT, INFRASTRUCTURE, BUILDINGS, AND COMMUNICATION

The TSI has the option to reuse certain roadside tolling equipment/devices, along with all existing infrastructure, conduits, cabinets, hub buildings, and electrical and communications equipment and cabling. This section describes the equipment and infrastructure that is currently installed. Unless explicitly stated otherwise, the TSI may reuse any or all equipment currently installed, subject to the limitations of the approved transition plan.

The TSI has the option of retaining the existing equipment specified herein, with the condition the TSI’s delivered system will conform to contractual functional and performance requirements for the term of the contract. CTRMA does not assert the condition, functionality, or performance of installed equipment. It is incumbent on the TSI to determine the condition and fitness for the use of any currently installed equipment to be reused.

All other equipment provided under this Scope of Work will also be required to meet the requirements detailed herein and applicable Service Level Agreements (SLA), as described in Appendix 7, Service Level Agreement (SLA).



Additionally, the TSI shall de-install, remove from the premises, and properly dispose of any un-needed existing equipment following the appropriate CTRMA policies.

Table 2-4: General Requirements

ID	Rule
REQ-1	If any proposed new equipment increases non-dynamic/static forces or dynamic/live load on an existing support structure, the TSI shall submit a structural analysis of the existing support structure for CTRMA’s review, approval, and professional stamp.

2.3.1 Existing Tolling Equipment

As previously described in Section 2.1, CTRMA operates five (5) All-Electronic Toll (AET) facilities, including one (1) Express Lane facility in the Austin area. Table 2-5, sorted by monthly average transaction data per facility, provides a listing of the different CTRMA facilities and plazas and their historical transaction data.

Table 2-5: The Historical Transaction Data of CTRMA Facilities and Plazas

Facility	Plaza	Type	Monthly Average Transaction Data (2019)	Generator at Plaza
183-A	Park Street Mainline NB	Mainline	1,056,625	Yes
183-A	Park Street Mainline SB	Mainline	1,001,870	No
183-A	Lakeline NB Mainline	Mainline	780,687	Yes
183-A	Lakeline SB Mainline	Mainline	689,193	Yes
183-A	Crystal Mainline SB	Mainline	605,071	No
183-A	Crystal Mainline NB	Mainline	588,867	Yes
183-A	Brushy Creek NB	Ramp	147,436	Yes
183-A	Brushy Creek SB	Ramp	106,135	Yes

Facility	Plaza	Type	Monthly Average Transaction Data (2019)	Generator at Plaza
183-A	Scottsdale Drive NB	Ramp	38,636	Yes
183-A	Crystal Parkway NB	Ramp	15,587	No
183-A	Crystal Parkway SB	Ramp	14,667	No
183-S	MLK Mainline SB	Mainline	146,961	No
183-S	51st Mainline NB	Mainline	36,710	Yes
183-S	51st Exit Ramp	Ramp	59,039	Yes
183-S	51st Entry Ramp	Ramp	169,522	Yes
US290 E	Giles Mainline WB	Mainline	538,766	Yes
US290 E	Giles Mainline EB	Mainline	508,628	No
US290 E	Parmer Mainline EB	Mainline	356,354	Yes
US290 E	Parmer Mainline WB	Mainline	331,139	No
US290 E	183 Entry	Ramp	289,436	Yes
US290 E	183 Exit	Ramp	218,423	No
US290 E	Giles Lane WB	Ramp	71,792	Yes
US290 E	Giles Lane EB	Ramp	62,945	No
US290 E	Springdale Road EB	Ramp	26,872	No
US290 E	Harris Branch EB	Ramp	21,938	No
US290 E	Harris Branch WB	Ramp	15,286	Yes
US290 E	Springdale Road WB	Ramp	14,649	Yes
US290 E	130 DC Entry WB	Ramp	6,745	Yes
SH-71	973 East	Mainline	475,368	Yes
SH-71	973 West	Mainline	395,249	No
MoPac	RM2222 SB	Mainline	377,282	Yes
MoPac	Enfield NB	Mainline	335,772	Yes
MoPac	Far West NB	Mainline	204,104	Yes
MoPac	Parmer SB	Mainline	158,302	Yes
45 SW	Bear Creek Mainline WB	Mainline	100,114	No
45 SW	Bear Creed Mainline EB	Mainline	91,495	Yes

There are also three locations on MoPac that support portable generators. These locations are not tolling sites (plazas); they are sign cabinets.

Detail of the hardware currently installed at these plazas can be found in Appendix 16, Existing Conditions Report. Details of the available spare hardware can be found in Appendix 9, Equipment List.

2.3.2 Existing Deficiencies

After the TSI assesses the existing equipment and infrastructure, the TSI shall be required to certify in writing to CTRMA that the ETCS, with the incorporation of any reused equipment, and the CTRMA-owned infrastructure, will meet the project SLAs as described in Appendix 7, Service Level Agreement. This certification shall be delivered to CTRMA no later than ninety (90) days after the issuance of a Work Authorization providing for the assessment of existing equipment and will communicate all existing equipment defects affecting functionality or performance

found. Defects identified after the ninety (90) day period shall be solely on the TSI to resolve. CTRMA will inspect each claimed defect within thirty (30) business days and determine the appropriate action (e.g., repair, replace, or retain as is) and the timing of the action. Any agreed-upon repair or replacement work may be performed through a change order.

2.4 ZONE CONTROLLER SUBSYSTEM

The functionality of the zone controller includes the following, at a minimum:

Table 2-6: Zone Controller Subsystem Technical Requirements

ID	RULE
REQ-2	The zone controllers shall be required to meet all applicable SLAs, as described in Appendix 7, Service Level Agreement.
REQ-3	The zone controllers are required to be implemented in a redundant, highly available configuration/capacity in either a highly-available or passive-active architecture.
REQ-4	The zone controller’s failover system shall ensure there is no loss of transactions or revenue due to a single zone controller failing. Any downtime between when a primary zone controller stops processing transactions, and the secondary zone controller begins processing transactions will count against the AV1 Zone Controller Availability.
REQ-5	The failover of a single zone controller shall not disrupt the operation of any other subsystem(s) and shall not require a restart of any subsystem.
REQ-6	Alarm messages shall be generated and transmitted to MOMS whenever a zone controller failover or outage event occurs.
REQ-7	The ETCS shall provide authorized users the capability to switch manually and remotely from the primary zone controller to the secondary zone controller. The switching from the primary zone controller to a secondary zone controller shall be recorded and transmitted to MOMS.
REQ-8	All zone controllers shall be capable of processing transaction volumes of at least 3,000 vehicles per lane per hour.

2.4.1 Stand-Alone Operation

Table 2-7: Stand-Alone Operation Technical Requirements

ID	RULE
REQ-9	The zone controllers shall be capable of operating in a stand-alone mode during communications disruptions between the zone controller and the TFH.
REQ-10	While in stand-alone mode, the zone controllers shall be capable of storing all transaction records, events, and maintenance messages for a minimum of thirty (30) days.
REQ-11	Complete lane transactions buffered in the lane when communications are lost shall be forwarded to the TFH when communications are restored.
REQ-12	When operating in stand-alone mode, the last configuration, security access, and application files downloaded from the TFH shall be used until communication is restored or files are uploaded locally.
REQ-13	Upon restoring communication with the TFH, all backlogged messages shall be transmitted without affecting near real-time transmission of ongoing transactions.

2.4.2 Software

Table 2-8: Software Technical Requirements

ID	RULE
REQ-14	Zone controllers shall process data obtained from AVI, AVD, AVC, VES, and other roadside devices and equipment systems to generate transaction records for each passing vehicle.
REQ-15	The operating systems, databases, COTS software, and ETCS software provided by the TSI shall support near real-time transaction creation.
REQ-16	The proposed operating systems and databases shall be currently supported versions/releases (i.e., no beta releases) with a future upgrade path. The zone controller’s operation system shall be the same version across all facilities.
REQ-17	The zone controller application version will be the same across all facilities.
REQ-18	Zone controller software shall be parameter-driven and user-configurable and shall be warranted against software defects and deficiencies until the contract is terminated.
REQ-19	All messages between the zone controller and the VES (e.g., ALPR data, triggers, and transaction link data), AVI, AVD, and AVC subsystems, and the TFH shall use a documented, non-proprietary protocol. This protocol shall be made available to and approved by CTRMA during the design phase of the project.
REQ-20	Zone controllers shall be required to detect and frame vehicles, including those with valid transponders, and associate all transactions with correct vehicle VES images.
REQ-21	One and only one transaction record shall be created for each vehicle that travels through a Toll Zone, and zone controllers shall ensure all available input data has been written to the transaction record before transmitting it to the TFH.
REQ-22	The zone controllers shall be able to automatically synchronize with the various sensors and subsystems at the lane level to ensure the events in the lane are associated with the correct vehicle transaction record.
REQ-23	Along with all other data elements required for a transaction record, vehicle length shall also be included.

2.4.3 Time Synchronization

Table 2-9: Time Synchronization Technical Requirements

ID	RULE
REQ-24	Zone controllers shall be time-synchronized to the Time Server at the time of zone controller startup and periodically after that.
REQ-25	The zone controller shall synchronize or transmit time synchronization messages with every connected Toll Zone subsystem or device/equipment capable of maintaining time.

2.4.4 Monitor All Lane Equipment for Device Status

Table 2-10: Monitor All Lane Equipment for Device Status Technical Requirements

ID	Rule
REQ-26	Each zone controller shall self-monitor the system health of internal components and all associated in-lane equipment device for status.
REQ-27	The system shall generate a recovery message and restore its operational status if a device recovers after reporting a failure.
REQ-28	Recovery messages shall be: <ol style="list-style-type: none"> 1. Recorded against the original failure work order 2. Reported through MOMS 3. Available to authorized staff
REQ-29	All alarm, health, and recovery messages shall be transmitted and reported to MOMS.
REQ-30	Anytime a work order is closed, the system shall automatically enable any/all alarms for the repaired equipment.

2.4.5 Diagnostics and Equipment Malfunction

The TSI shall ensure the system continues to operate without loss of revenue or visible impact to the patron if some components of the system fail, and the system begins degraded mode operations.

Table 2-11: Diagnostics and Equipment Malfunction Technical Requirements

ID	RULE
REQ-31	The zone controller software shall execute periodic diagnostics checks on all internal processes, the in-lane equipment, and interfaces. A device’s failure to respond to a status inquiry after a user-configurable number of retries shall be regarded by the zone controller software as an equipment failure.
REQ-32	All failures detected and alarms generated shall be reported to MOMS. Degraded modes of operation shall be supported based on CTRMA’s business rules developed during the design process and approved by CTRMA.

2.4.6 Configuration Files

Table 2-12: Configuration Files Technical Requirements

ID	RULE
REQ-33	All parameters and settings required to operate the zone controller application shall be maintained in a configuration file or files.
REQ-34	A copy of the current zone controller configuration files shall be maintained on the TFH and shall be available for downloading along with the zone controller application file, as needed.
REQ-35	Authorized personnel working in the field shall be able to make changes to the configuration file used by the zone controller.
REQ-36	Changes made in the field shall be backed up to the TFH. Any configuration files changed in the field shall be logged and assessed for applicability to all zone controllers and downloaded to other zone controllers, accordingly.
REQ-37	All zone controllers shall have default configuration files that allow the lane to startup automatically.

ID	RULE
REQ-38	All zone controllers shall operate with the same software version unless CTRMA approves exceptions to this requirement.

2.5 ROADSIDE SUBSYSTEM

The following sections provide requirements about the roadside subsystem.

2.5.1 Automatic Vehicle Identification (AVI) Subsystem

The TSI shall determine the need for conducting radio frequency (RF) interference tests at all proposed project sites that are currently equipped with Radio Frequency Identification (RFID) products. The TSI shall assure all related licensing and requirements are satisfied and to be aware of any RF sources that may interfere with the ETCS. CTRMA currently operates its AVI readers between 902.5 MHz and 921.5 MHz.

The TSI has responsibility for compiling all Federal Communication Commission (FCC) licensing materials.

The TSI shall provide certification that any new proposed reader’s 6C capabilities have been certified by an approved independent third-party laboratory (e.g., certification under the OmniAir Certification Services’ ISO 18000-6C certification program will satisfy this requirement).

The TSI shall be responsible for the AVI subsystem, including any design, provision, and installation involving enclosures (including heating/cooling if required), cabling, brackets, and ancillary components required for the proper functioning/operation of this subsystem. The TSI shall ensure the AVI subsystem meets the performance requirements identified in Appendix 7, Service Level Agreement.

After initial installation, the TSI maintains responsibility for the completion and submission of any FCC-required applications and maintenance forms to CTRMA for submission to the FCC.

CTRMA is responsible for submitting the completed forms to the FCC and the payment of all related FCC licensing costs.

CTRMA does not write to any transponders via the roadside ETCS.

Table 2-13: AVI Subsystem Technical Requirements

ID	RULE
REQ-39	The AVI subsystem shall support all applicable AVI business requirements and performance levels, as defined in Appendix 10, Lane System Business Rules, and Appendix 7, Service Level Agreement.
REQ-40	The AVI subsystem shall include a multi-protocol RFID reader capable of reading three standard protocols (E-ZPass TDM, ISO 18000-6C, and SeGo) at performance levels defined in Appendix 7, Service Level Agreement.
REQ-41	The AVI subsystem shall read all approved transponder types in vehicles (when present and properly mounted) that pass through the toll zone, including vehicles within travel lanes, straddling lanes, without degradation or interference at speeds ranging from stop-and-go to 100 mph.

ID	RULE
REQ-42	The AVI subsystem shall account for every lane transaction that is the result of a buffered/spurious transponder read for tracking and disposition, which shall be reported on and auditable by CTRMA.
REQ-43	The lane transaction shall indicate subsystem shall record up to three transponders and include them in the transaction record.
REQ-44	The lane transaction shall indicate which transponder is assumed to be the valid transponder for processing by the TFH. The lane transaction shall also include the other transponders in the lane transaction message.
REQ-45	Each RFID reader stores all information related to at least 125,000 transponder reads if the RFID operates in a stand-alone mode (i.e., there is no zone controller connectivity).

2.5.2 Automatic Vehicle Detection (AVD) and Classification (AVC) Subsystem

The TSI shall provide for both in-ground and above ground Automatic Vehicle Detection (AVD) and Automatic Vehicle Classification (AVC) systems. Wherever the TSI chooses to re-use existing in-ground AVD and AVC systems on existing CTRMA facilities, the TSI shall certify in writing to CTRMA that the ETCS, with the incorporation of any reused equipment, and the CTRMA-owned infrastructure, will meet the project SLAs as described in Appendix 7, Service Level Agreement.

CTRMA will direct the TSI to implement either in-ground or above ground AVD and AVC systems, on a per facility basis, and even on a per location basis. The TSI is encouraged to provide designs that will contribute to an infrastructure that takes into consideration all aspects of long-term maintenance and support. It is, however, incumbent on the TSI to provide a technically compliant, competitively priced solution that meets the stated requirements.

Both in-ground and above ground ACD and AVC systems will meet the following technical requirements:

Table 2-14: AVC Subsystem Technical Requirements

ID	RULE
REQ-46	The AVC subsystem shall support all applicable AVC business rules and performance requirements, as described in Appendix 10, Lane System Business Rules, and Appendix 7, Service Level Agreement.
REQ-47	The AVC subsystem shall detect all vehicles that pass-through toll lanes and toll zones, including vehicles within travel lanes, within shoulders, straddling lanes, or straddling a lane and shoulder, without degradation or interference.
REQ-48	The AVC subsystem shall correctly separate vehicles moving below 30 miles per hour within 2 feet distance measured front to rear, and within 5 feet distance measured front to rear above 30 miles per hour, to ensure that multiple vehicles are not identified as a single vehicle.
REQ-49	The AVC subsystem shall correctly associate multi-unit vehicles (e.g., a vehicle towing a trailer) using a minimum 2-inch tow bar (measured perpendicular to the lane direction of travel) to ensure that the multi-unit vehicle is identified as a single vehicle.
REQ-50	If the TSI proposes an overhead AVC subsystem, the system must be able to be implemented as a redundant trigger to the VES cameras.

ID	RULE
REQ-51	The Vehicle Detection, Separation, and Classification subsystem shall support all applicable vehicle detection and separation business rules and performance requirements as defined in Appendix 10, Lane System Business Rules, and Appendix 7, Service Level Agreement, including the following: <ol style="list-style-type: none"> 1. Detecting vehicles at required speeds 2. Separating vehicles at required speeds Classifying vehicles at required speeds
REQ-52	The Vehicle Detection, Separation, and Classification subsystem shall provide vehicle event messages and signals to the zone controller and may also directly trigger the VES cameras.
REQ-53	The status of the Vehicle Detection, Separation, and Classification subsystem shall be reported to MOMS, and the zone controller shall write health status codes to transaction records indicating a degraded state when the transaction is built.

2.5.3 Violation Enforcement Subsystem (VES)

Table 2-15: Violation Enforcement Subsystem Technical Requirements

ID	RULE
REQ-54	The VES shall support all applicable VES business and performance requirements, as defined in Appendix 10, Lane System Business Rules, and Appendix 7, Service Level Agreement.
REQ-55	All transactions (including those with transponders) shall have images captured and associated.
REQ-56	The VES shall capture images of all vehicle license plates with sufficient sharpness for the ALPR to automatically extract the plate number, type, and jurisdiction.
REQ-57	The VES shall capture at least one front and one rear image of every vehicle that passes through a lane or Toll Zone. All images captured shall be associated with the correct lane transaction.
REQ-58	The VES shall create a region of interest image from the image used to determine the license plate data showing a focused view of the license plate with the license plate data readable to the unaided eye.
REQ-59	The VES shall machine-read images and identify license plate information, including license plate type, alphanumeric characters, and jurisdiction of origin, to be included in the lane transaction message. The lane transaction message shall also include automated ALPR processing confidence levels.

ID	RULE
REQ-60	The VES shall flag all images which should be queued for human review, by user-configurable parameters, including the following: <ol style="list-style-type: none"> 1. ALPR confidence threshold 2. License plates/vehicles that have not been previously recorded by the system 3. Random images with configurable sample sizes 4. Other unusual occurrences such as vehicle classification mismatches 5. Any other parameter required for the TSI's Quality Assurance/Quality Control (QA/QC) process for images to achieve the performance requirements
REQ-61	The VES shall buffer/store images locally (either in the Toll Zone or a Host system) until successful image transmission to the storage location for image review.
REQ-62	The VES shall store all images (including those associated with valid AVI transactions) for a user-configurable rolling period per CTRMA's data retention guidelines. Refer to Appendix 12, Data Retention Schedule.
REQ-63	The VES shall make images available to CTRMA's Host per the accepted Interface Control Document (ICD).
REQ-64	Images shall be stored image-by-image as separate digital files, with an open-standard file architecture linked to the transaction record.
REQ-65	To support the rapid detection of poor performing cameras, the VES shall send alarm messages to MOMS. These messages shall indicate if the image quality of a VES camera has degraded such that its ALPR confidence falls below a user-configurable threshold. This threshold shall be based on the rolling average of a user-configurable number of images, or a camera is producing black (i.e., no picture) images.
REQ-66	CTRMA uses a third-party ALPR application for habitual violators and other programs off-line from the TSI-provided ETCS. The TSI shall support this third-party ALPR application by allowing VES images to be accessed in a read-only form. This access will be available to the third-party application in near real-time of the image capture at the roadside.

2.5.3.1 VES Cameras and Illumination Devices

The TSI shall be responsible for familiarizing themselves with all roadside illumination specifications.

Table 2-16: VES Cameras and Illumination Devices Technical Requirements

ID	RULE
REQ-67	Camera illumination devices shall be mounted/installed in such a way as not to distract or limit the vision of drivers. Visible light levels shall not be increased at any Toll Zones.
REQ-68	Cameras and illumination devices shall support a capture rate of no fewer than two vehicles per second.

2.5.4 Uninterruptible Power Supply (UPS) Subsystem

Table 2-17: UPS Subsystem Technical Requirements

ID	RULE
REQ-69	All toll equipment shall be UPS protected and supported with a minimum of one (1) hour runtime. Whenever a UPS is activated, an alert shall be sent to MOMS. The TSI shall monitor all UPS alerts, which may include the Simple Network Monitoring Protocol (SNMP) using a COTS smart interface module
REQ-70	Should the TSI chose not to reuse the existing UPS subsystem, the TSI shall furnish a UPS to be mounted in cabinets that include an exterior locking receptacle for plugging in a portable generator to allow connectivity with no tools required.
REQ-71	If an online UPS fails, an auto-sync transfer shall bridge line power and utility power so that power supply is maintained.
REQ-72	A surge protection device shall be used to protect utility service that is not UPS filtered.
REQ-73	UPS installation shall include a bypass switch to allow maintenance of the UPS module while continuing to service the current electrical load.
REQ-74	Whenever any of the following occur, an alert/alarm shall be generated and sent to maintenance personnel and the CTRMA staff via MOMS: <ol style="list-style-type: none"> 1. UPS detects loss of electrical utility service 2. UPS battery level reaches a user-configurable low point 3. UPS is bypassed or disconnected

2.5.5 Digital Video Audit Systems (DVAS)

The TSI shall either furnish and install new or certify and accept in conjunction with CTRMA’s existing DVAS equipment.

The TSI shall provide a comprehensive DVAS that enables the CTRMA staff to verify/reconcile/audit toll transactions from all lanes, to review videos of events and/or incidents in the express lane(s), and to identify possible irregularities.

Table 2-18: Digital Video Audit Systems (DVAS) Technical Requirements

ID	RULE
REQ-75	The DVAS shall interface with other roadside equipment to receive vehicle transactional and status data of toll lane equipment. This data shall include individual sensor state changes, AVI reads, location (e.g., facility, plaza, lane), date/time, vehicle class, and toll rate.
REQ-76	During design and installation, the DVAS cameras will be positioned or repositioned such that they can distinguish all axles having wheels in contact with the pavement and raised axles where the wheels are not in contact with the pavement.
REQ-77	During design and installation, the DVAS cameras can be relocated for axle-verification.
REQ-78	Zone controller transactional data will be overlaid onto the DVAS video data displayed on the screen. This transactional data shall include the following, at a minimum: date, time, lane, plaza, facility, classification, and transponder number.

ID	RULE
REQ-79	The user interface shall provide the capability to select and review videos based on the timeframe, location (e.g., facility, plaza, lane), tag number, vehicle class, and transaction identifier from the TFH. The user interface shall allow the selected video to be replayed in real-time, in slow motion at a maximum playback rate of 1/8x, frame by frame, as well as accelerated playback rate at a minimum of 8x. The user interface will allow the user to “scroll” through the selected video with a pointing device (i.e., mouse).
REQ-80	The DVAS shall have the ability to print selected video images with associated transactional data.
REQ-81	All digitized DVAS video and corresponding transactional data will be synchronized/coupled and will be stored to allow historical viewing and analysis.
REQ-82	The DVAS shall allow an authorized operator/user to set cameras up and configure them individually. Configuration settings shall be available on a per camera basis.
REQ-83	The DVAS shall provide clear video/images of the intended subject area during weather conditions typical to the local Austin area, regardless of ambient lighting.
REQ-84	The DVAS shall provide an overall view of the traffic flow for the toll zone (i.e., loops and treadles).
REQ-85	Whenever DVAS video data is being reviewed, the corresponding transactional data will be displayed on the screen.
REQ-86	As DVAS video is “scrolled,” transactional data elements will “scroll” with the video.
REQ-87	The capability to control any/all DVAS cameras shall be User ID and password protected.
REQ-88	DVAS video shall be stored in an unencrypted format and available for review without the use of special equipment or software in a standard format (e.g., AVI, MP4, MOV).
REQ-89	DVAS video needs to be available for streaming to remote locations (off-site from CTRMA) in real-time, as well as in slow motion at a maximum playback rate of 1/8x, frame by frame, as well as accelerated playback rate at a minimum of 8x
REQ-90	DVAS video shall be stored as defined in CTRMA’s Data Retention Schedule, Appendix 12.
REQ-91	The DVAS shall allow for the export of video to external media in an unencrypted format and available for review without the use of special equipment or software in a standard format (e.g., AVI, MP4, MOV).

2.5.6 Closed Circuit Television (CCTV) Subsystems

CCTV cameras are required along all the CTRMA toll facilities in support of the DVAS and to observe VTMS messages.

The TSI will be responsible for running power/data connections from the power/data equipment enclosure(s) to the TSI installed equipment.

The TSI shall coordinate with CTRMA to establish the initial camera field of view and focus on providing an optimum image both for the DVAS and for the VTMS display.

No existing CCTV cameras used by the CTRMA operations staff for traffic verifications shall be removed from service without notification from CTRMA, and any outage or lapse in roadway coverage shall be limited to overnight or non-peak periods.

Table 2-19: CCTV Subsystem Technical Requirements

ID	RULE
REQ-92	The TSI shall either certify and accept existing CCTV cameras and mounting brackets, cabling and controls or furnish and install replacements meeting all performance, availability, and functionality requirements.
REQ-93	If cameras are proposed to be relocated or expanded, the TSI shall provide installation plans (e.g., shop drawings) for all relocated and expanded CCTV subsystem components.
REQ-94	Shop drawings and as-built drawings for proposed components will be submitted to CTRMA for approval.
REQ-95	All CCTV cameras shall be IP-based digital cameras and connect to the existing fiber communications network supporting all other roadside equipment.
REQ-96	All CCTV camera enclosures shall be designed and manufactured for continuous operation in weather conditions typical to the local Austin area. All CCTV cameras shall provide clear video and images of objects within the field of view regardless of ambient lighting (for both day and night) and weather conditions.
REQ-97	<p>Camera required attributes and capabilities shall include the following:</p> <ol style="list-style-type: none"> 1. Day (color)/night (monochrome) operation 2. IP addressable 3. Digital high definition resolution (1280 x 720 px, minimum) 4. Automatic focus 5. Capable of remote firmware upgrade via the communication interface
REQ-98	<p>Video encoding required attributes and capabilities shall include the following:</p> <ol style="list-style-type: none"> 1. Moving Picture Experts Group’s 4, part 10 (H.264) video compression technology 2. Encoded video transmitted using programmable bit rates 3. Color and monochrome video delivered at up to thirty (30) Frames Per Second (FPS) regardless of resolution
REQ-99	<p>Lens required attributes and capabilities shall include the following:</p> <ol style="list-style-type: none"> 1. Automatic and manual focus and iris control capabilities 2. High definition providing a minimum 24X motorized automatic optical zoom lens with optical iris 3. Depth of field that provides a clear image of roadside areas within the cameras range under all lighting conditions 4. A maximum aperture of at least f/1.6
REQ-100	<p>Dome required attributes and capabilities shall include the following:</p> <ol style="list-style-type: none"> 1. Pressurized dome with low-pressure alarm feature 2. Dome enclosures of NEMA 4X/IP-67 rating
REQ-101	<p>Communication/network interface attributes and capabilities shall include the following:</p> <ol style="list-style-type: none"> 1. National Transportation Communications for ITS Protocol 1205 v1.08 2. Capable of communication with other equipment and processors using transmission control protocol/IP, or user datagram protocol/IP 3. Real-Time Streaming Protocol (RTSP), per IETF RFC 2326 4. IEE802.3 compliant Local Area Network (LAN) connection for 10/100 Ethernet connections 5. Minimum of one 10/100 Base-TX Ethernet port
REQ-102	All components in this subsystem (e.g., cameras and servers) shall be integrated with MOMS for component status reporting, alert generation, and diagnostic messaging.

ID	RULE
REQ-103	All externally mounted or installed components of the DVAS and VTMS CCTV system (e.g., brackets, enclosures, cabling, and connectors) shall be appropriately sealed and/or enclosed such that they will operate continuously. These components shall provide in-focus images for DVAS and VTMS data under typical weather/lighting conditions in the Austin metro region.
REQ-104	The video from these cameras shall be continuously recorded at a minimum of one (1) Frame Per Second (FPS).
REQ-105	
REQ-106	The CCTV equipment shall integrate into a system/application provided by the TSI that the CTRMA staff may utilize to view the VTMS in real-time and review recorded/historical VTMS video data.
REQ-107	CCTV video shall be stored as defined in CTRMA’s Data Retention Schedule, Appendix 12.

2.5.7 Traffic Sensors

Table 2-20: Traffic Sensors Technical Requirements

ID	RULE
REQ-108	The traffic sensor subsystem shall support all applicable traffic sensor business rules and performance requirements as defined in Appendix 10, Lane System Business Rules, and Appendix 7, Service Level Agreement.
REQ-109	At a minimum, the proposed traffic sensor units shall measure and output vehicle speed, vehicle count/volume, lane occupancy, and vehicle direction for the same quantity of travel lanes as currently measured.
REQ-110	Proposed traffic sensor units shall support appropriate industry standard requirements for device implementation (IP addressable), device set-up and configuration, operational requirements (all weather conditions), frequency, and will provide for the following, at a minimum: <ol style="list-style-type: none"> 1. Detection of vehicles in up to 12 lanes 2. Detection of vehicles over barriers 3. Detection of vehicles from between 6 ft and 250 ft 4. Per vehicle data including speed, length, class, and lane assignment 5. Eight (8) classification bins 6. 15-speed bins
REQ-111	The traffic sensors shall not be used for input to vehicle transaction records. Data output from these sensors shall only be transmitted and aggregated for input to the Dynamic Pricing Engine (DPE) for use by CTRMA’s TFH operators.
REQ-112	Traffic sensor data sent in near real-time shall be timestamped when it arrives at a traffic server that parses, aggregates, and averages the raw traffic before being used by the DPE.
REQ-113	Failure to receive data from any traffic sensor shall result in a MOMS notification being generated to maintenance personnel.
REQ-114	The ETCS shall store all traffic sensor data in a database for reporting.

2.5.8 Variable Toll Message Signs (VTMS)

Table 2-21: VTMS Systems Technical Requirements

ID	RULE
REQ-115	The VTMS shall allow for a display of a minimum of six digits.
REQ-116	The VTMS system shall support all applicable VTMS business rules and performance requirements, as defined in Appendix 10, Lane System Business Rules, and Appendix 7, Service Level Agreement.
REQ-117	The VTMS shall be connected to the ETCS roadside network (fiber-optic network) and shall display/communicate the current toll rate to motorists traveling the Express Lane Corridor.
REQ-118	The specific toll rate messages that will be displayed on these VTMS will be finalized during the design phase(s) of the project(s) to include, at a minimum, both the AVI and Pay By Mail rates.
REQ-119	If any VTMS loses communication with the TFH, an alert shall be generated in MOMS, and the VTMS will display a default message.
REQ-120	This default message shall be agreed to during the design phase of the project(s).
REQ-121	VTMS controllers shall be capable of implementing localized override commands in situations where communication may be lost to the DPE to display special pricing and or messages to motorists traveling CTRMA’s Express Lane facilities.
REQ-122	Anytime localized override commands are implemented on the VTMS, a log of those commands shall be available to CTRMA for rating or re-rating trips during the override period.
REQ-123	Communications with the VTMS shall include message acknowledgments such that messages and the content of messages (toll rates) are positively acknowledged.
REQ-124	In instances where messages or message content is not positively acknowledged, a MOMS alert will be generated, and the event will be identified in VTMS SLA reporting.
REQ-125	The VTMS shall utilize a default rate table stored locally in the sign controller. In the event communication is lost with the VTMS, the VTMS will revert to default rates. The default rate table shall be based on historical rates in increments as small as 15 minutes.

2.6 TOLL FACILITY HOST (TFH)

CTRMA requires a Toll Facility Host (TFH) system to perform the ETCS functions that meet the requirements as described herein.

The TFH will provide for the following subsystems and functionalities:

1. Dynamic Pricing
2. Image Processing (ALPR and Manual Image Review)
3. VES Image Storage
4. Trip Building
5. Reports
6. Transaction Audit Functionality
7. Interfaces
8. Express Lanes User Interface (ELUI)
9. Toll Fare Schedules Management (for Non-Express Lane Facilities)
10. ETCS User Administration
11. Exempt Vehicle List Management

The TSI is responsible for all aspects of the design, development, testing, and implementation of the TFH, which shall support applicable business rules and performance requirements as defined in Appendix 10, Lane System Business Rules, and Appendix 7, Service Level Agreement.

The TSI will provide a TFH that is fully redundant by way of high availability clustering, or by way of a failover Disaster Recovery (DR) site, cloud-based DR, or DR service.

The TFH subsystems shall be web-based and accessible by the CTRMA staff and the CTRMA-designated representatives through logins without the installation of software.

TFH must be accessible without a VPN network if accessed through CTRMA’s network and by way of a VPN/remote desktop if the user is not on the CTRMA network.

The TFH shall provide a graphical user interface (GUI) for ETCS administration and user management. In addition, the TFH shall provide the functionality to manage the exempt vehicle list and capability to store local copies of the Tag Validation List/License Plate Validation List (TVL/LVL) received from CTRMA’s DPS.

Table 2-22: General TFH Technical Requirements

ID	RULE
REQ-126	The TSI shall provide a new TFH that shall receive, aggregate, process, and report on all toll transactions from vehicles that travel through the toll lanes.
REQ-127	The TSI shall provide the software, hardware, and personnel needed to support the TFH requirements specified herein.
REQ-128	All transactions, images, and messages transferred between all subsystems shall have the required data validation controls to confirm the complete, accurate, and timely transfer of data.
REQ-129	The interaction between applications and system components shall be based on an open architecture that is decoupled, flexible, agile, scalable, and robust.

ID	RULE
REQ-130	It is preferred that the TFH software uses non-proprietary open-standard Application Programming Interfaces (APIs) that are maintained by the TSI and enables the use of or includes an industry-standard Enterprise Service Bus.
REQ-131	All TFH shall be internet browser-based.
REQ-132	The TFH shall support and define the toll rate schedule.
REQ-133	The TFH shall support user-configurable toll rate schedule(s) for transponder, registered license plate, and Pay By Mail.
REQ-134	The TFH shall provide a graphical user interface to support fixed rate fare assignment, including the ability to add, edit, and delete by user role.
REQ-135	The TFH shall only allow authorized users shall create, modify, or delete the toll rate schedules.
REQ-136	The TFH shall require an authorized user to review, accept, and transmit the toll rate schedule. However, this user shall not have the ability to create or modify any toll rate schedule.
REQ-137	The TFH shall enforce an effective begin and end date on each toll rate schedule.
REQ-138	The TFH shall enforce that only one toll rate schedule shall be in effect at any point in time.
REQ-139	A new toll rate schedule shall be in effect when its "begin date" is less than or equal to the "current date" and its "end date" is greater than the "current date."
REQ-140	The TFH shall include a web-based UI that will enable CTRMA and the TSI personnel to manage the operations of the ETCS.
REQ-141	The TFH administration system controls and configurations shall require a secure login and provide role-based access to different levels and features.
REQ-142	The TFH shall allow for a web-based UI that will enable CTRMA to manage an exempt vehicle list.
REQ-143	The TFH shall allow authorized users to add, edit, or remove vehicles individually from the exempt vehicle list or import multiple vehicles using a Comma Separated Values (CSV) file template.
REQ-144	The TFH shall allow authorized users to export a list of all exempt vehicles, including at a minimum, organization/customer name, active/inactive vehicles, effective dates, and license plate/transponder information.
REQ-145	The exempt vehicle list shall allow authorized users to group vehicles by organization /customer name.
REQ-146	The exempt vehicle list shall allow authorized users to create a group by customer/organization name.
REQ-147	The exempt vehicle list shall allow authorized users to remove an organization/customer and all associated vehicles at one time.
REQ-148	The TFH shall allow authorized users to assign license plate and/or transponder information to all vehicles.
REQ-149	The TFH shall allow authorized users to add, edit, or remove any combination of CTRMA's facilities and designated partner agency facilities (e.g., all, some, or none) to designate each facility a vehicle qualifies for an exemption.

ID	RULE
REQ-150	The TFH shall allow authorized users to transfer exempt vehicles from one customer/organization to another.
REQ-151	The TFH shall allow authorized users to assign an exemption type for each customer/organization (e.g., disabled veterans, fire/police/emergency medical services, and maintenance vehicles).

2.6.1 Dynamic Pricing

The TSI shall be responsible for the delivery and implementation of a Dynamic Pricing Engine (DPE) to support the dynamic calculation and display of toll rates through VTMS.

The TSI-provided DPE is responsible for the calculation and accuracy of the dynamic toll rates at a user-configurable interval using speed, volume, and density of the traffic.

The TSI shall determine the business rules, workflow, and dynamic pricing algorithms to meet the DPE performance through VTMS availability SLAs provided in Appendix 7, Service Level Agreement.

Table 2-23: Dynamic Pricing Technical Requirements

ID	RULE
REQ-152	The DPE shall support all applicable dynamic pricing business rules, as described in Appendix 10, Lane System Business Rules, and performance requirements, as defined in Appendix 7, Service Level Agreement.
REQ-153	The DPE shall periodically and dynamically calculate the toll rate based upon Express Lane and General Purpose (GP) Lane traffic speed, volume, density information, and Time of Day (TOD) considerations.
REQ-154	The DPE shall allow CTRMA to configure the timeframe for the toll rate calculation to execute (pricing interval). The DPS shall use a CTRMA configurable “target” LOS to drive the toll rate calculation.
REQ-155	The objective of the toll rate setting is to maintain a user-configurable minimum level of service (LOS) constraint for the Express Lane.
REQ-156	The DPE shall determine the LOS per the Highway Capacity Manual and AASHTO guidelines.
REQ-157	The DPE shall allow for the system to post variable, pre-determined rates based on time of day and day of the week.
REQ-158	The DPE shall optimize tolls for the upcoming tolling interval to maximize throughput while maintaining a level of service across the facility.
REQ-159	The DPE shall have the flexibility to consider congestion optimization.
REQ-160	The DPE shall be capable of accommodating different parameters for the determination of the toll rate based on anomalies, peak, off-peak, special events, holidays, and weekends.
REQ-161	The DPE shall allow for operators to manually override past, current, and future rates in bulk and have those override rates post to the VTMS. These override rate plans will go into effect at a user-selected timeframe (immediately, at the next pricing interval, and in the future).

ID	RULE
REQ-162	The DPE shall be able to calculate different rates by entry/exit plaza.
REQ-163	The DPE shall be capable of setting a maximum and minimum price for segments of the facility through a user-configurable parameter.
REQ-164	The DPE shall have a user-configurable minimum and maximum amount that the toll rate can increase and decrease between calculation cycles (pricing interval).

2.6.2 Image Processing (ALPR and Manual and/or Automated Image Review) and VES Image Storage

The TSI shall be responsible for all VES image capture, all VES image review, and identification of license plate number, jurisdiction, and type for all transactions on all the CTRMA facilities. All images captured and stored by the TSI-provided ETCS shall be subject to CTRMA’s Data Retention Policy provided in Appendix 12. CTRMA requires a double-blind review of each image when images are manually reviewed and requires that one of these double-blind reviews is completed by human review or by an approved automated method

The TSI can propose an automated image review method that meets the Image Processing System (IPS) performance and accuracy SLAs provided in Appendix 7. CTRMA will review and approve or reject the use of an automated method for image reviews. If after the approval for use of the automated image review method, and if at any time it is found to be not in compliance with SLA AC6, SLA AC5 and SLA SP 3 from Appendix 7 Service Level Agreement, CTRMA will suspend the use of the automated image review method at the same contracted price.

The TSI shall determine the business rules, workflows, and processes for the VES image review required to meet the Image Processing System (IPS) performance and accuracy SLAs provided in Appendix 7. These business rules, workflows, and processes shall be included in the design documents submitted by the TSI.

The TSI shall record a code-off code when the automated or manual review fails to return a license plate result for all processed transaction images. The code-off codes shall be agreed upon with CTRMA to ensure consistency in monitoring and reporting. The method of assigning a code-off code, when multiple reasons for failure are present shall be agreed upon with CTRMA to ensure system-caused, and vehicle-caused errors are monitored and reported on consistently.

The output of the image review process shall contain the following data elements: license plate number, jurisdiction, plate type, ROI coordinates, ALPR confidence, code-off codes (if applicable), and the date and time. These data elements containing the final license plate result are then assigned to the transaction record.

CTRMA shall have the ability to see the review history of all images processed in the IPS.

The TSI shall be responsible for capturing the image transactions through the VES and storage of images in separate digital files in an open-standard file architecture linked to the transaction record.

The TSI shall proactively manage and report to CTRMA any potential image processing backlogs. This reporting shall ensure CTRMA is aware of any possible delays in manual image review queues or systematic image processing that may impact revenue or downstream operational processes (e.g., delays in interoperability or Pay By Mail processing).

The IPS shall include image audit functionality for CTRMA to assess the accuracy and performance of the system. The IPS shall adhere to the following requirements:

Table 2-24: Image Processing System Technical Requirements

ID	RULE
REQ-165	The IPS shall support all applicable image processing business rules in Appendix 10, Lane System Business Rules, and performance requirements, as defined in Appendix 7, Service Level Agreement.
REQ-166	The IPS shall support audit functionality to measure the accuracy of license plate results and code-off accuracy at defined intervals or as desired by CTRMA and provide results via dashboards and reports.
REQ-167	The IPS shall have a GUI/screen to allow for the creation of audit sets and to view all the audit sets in a user’s audit setlist.
REQ-168	<p>This screen shall show the following fields for each of the audit sets:</p> <ol style="list-style-type: none"> 1. Audit Set ID 2. Audit Set Name 3. Created Date 4. Last Audited Date 5. Completed Date 6. Status of the audit (e.g., in progress, completed, created) 7. Number of images audited 8. Number of images remaining to be audited
REQ-169	The screen shall allow an audit user to view the details of the underlying image transaction contained in the audit set.
REQ-170	<p>The IPS shall allow an audit user or audit manager the ability to create an audit set with a configurable number of random images with the following criteria:</p> <ol style="list-style-type: none"> 1. A selectable date range based on the transaction date 2. Facility 3. Direction 4. Plaza 5. Lane 6. Jurisdiction 7. Plate Type 8. Image Failure Code

ID	RULE
REQ-171	<p>The IPS shall allow an audit manager to create an audit set with a configurable number of random images from completed image audits performed by an audit user. The audit set creation criteria shall be selected with the following criteria:</p> <ol style="list-style-type: none"> 1. A selectable date range based on the transaction date 2. A selectable date range based on the audited date 3. Facility 4. Direction 5. Plaza 6. Lane 7. Jurisdiction 8. Plate Type 9. Image Failure Code 10. Audit Set ID 11. Auditor
REQ-172	<p>For all audit sets sent to audit users and audit managers, the IPS shall store all the audit set creation information as a unique record for retrieval. This information shall be available in the reporting system.</p>
REQ-173	<p>The IPS shall allow IPS audit users to modify, delete, and archive audit sets in their audit setlist. The following conditions apply to audit sets:</p> <ol style="list-style-type: none"> 1. A modification shall only be available if the audit set has not yet been started 2. The image processing system shall denote audit sets that have been deleted by the audit users 3. Completed audit sets shall not be deleted 4. Archived audit sets shall be hidden from view in the audit set GUI but shall be reported on in the reporting system. Only completed audit sets shall be achievable
REQ-174	<p>The IPS shall allow audit users to audit any audit set, in their audit set list, in any order.</p>
REQ-175	<p>The IPS shall allow audit users to review an audit set.</p>
REQ-176	<p>The IPS shall allow audit users to partially review an audit set. Partially reviewed audit sets are not considered complete, but in-progress.</p>
REQ-177	<p>The IPS shall allow audit managers to assign audit sets to audit users.</p>

ID	RULE
REQ-178	<p>The IPS shall provide an IPS audit set schedule screen to allow users to schedule the creation of audit sets.</p> <ol style="list-style-type: none"> 1. Audit scheduling shall allow audit users to schedule audit set creation based on relative dates from the transaction date, including the following: <ol style="list-style-type: none"> a. Last day b. Last week c. Last month d. A configurable number of days/weeks/months before the current date 2. Audit scheduling shall allow audit users to schedule the creation of audit sets at different frequencies, including the following: <ol style="list-style-type: none"> a. Daily, by the time of day b. Weekly, by the day of the week c. Monthly, by the date of the month 3. Audit scheduling shall allow users to configure start and end dates for the audit schedule <ol style="list-style-type: none"> a. If an end date is not specified, the schedule shall run indefinitely until an audit user manually ends the schedule 4. If an audit user modifies a schedule, changes to the schedule shall be in effect upon the completion of the modification to the schedule 5. Audit set schedule screen shall allow users to see schedules they created, including the following: <ol style="list-style-type: none"> a. Created date b. Modified date c. Schedule end date d. Schedule details 6. The IPS shall alert the user that created the schedule when the following occurs: <ol style="list-style-type: none"> a. The IPS successfully created an audit set b. The IPS failed to create an audit set

ID	RULE
REQ-179	<p>The review audit set screen shall have the following functionality:</p> <ol style="list-style-type: none"> 1. The color image associated with the highest system accuracy score is to be presented as the initial image for the IPS audit users. If an image set has no score result, the brightest color image is to be presented as the initial image for the IPS audit users. 2. The Region of Interest (ROI) of the vehicle must be from the best and most likely image displayed and must be displayed in a large view, with other possible images associated with the transactions displayed on the same screen in smaller views. 3. Mouse button use is strictly limited to tasks such as choosing the image and ROI, if necessary. Most operator functions shall be done through a single or limited keystroke(s) and will not require a mouse (e.g., use of “hot” keys). 4. Display the transaction information related to the image set, including the following: <ol style="list-style-type: none"> a. Date b. Time c. Location (e.g., Facility, Plaza, Lane Number, Camera ID) d. Transponder ID and agency if available e. Transaction ID 5. The final license plate result or code-off code is to be displayed with the associated image set. 6. The IPS audit users shall be able to pass, fail, or skip transactions. <ol style="list-style-type: none"> a. Pass is when an IPS audit user agrees with the presented license plate result or image failure code b. Fail is when an IPS audit user disagrees with the presented license plate result or image failure code c. Skip is when an IPS audit user can neither agree nor disagree with the presented license plate result or image failure code 7. In the event where the IPS audit user fails the transaction, the user must submit a failure reason code for failing the transaction. 8. Failure reason code shall be configurable by CTRMA. 9. An auditor shall have the ability to go back and edit at least the last ten transactions processed by the audit user. 10. The system shall auto-save review results after a minute of inactivity. 11. The system shall provide on-screen tools to allow user adjustment of color, contrast, and brightness.
REQ-180	The IPS shall have search tools to locate images and data in the database.
REQ-181	Search results shall allow for the display of images (as in a gallery), data, or both.
REQ-182	Search results shall have the capability to be exported in HTML, PDF, CSV, and excel formats to the user’s desktop or other location.
REQ-183	The search results shall be capable of being selected individually or as a subset of the data set for export.

ID	RULE
REQ-184	Search criteria shall include but will not be limited to date/time/range, locations (facility, plaza), lane(s), transponder ID, license plate, jurisdiction, camera ID, transaction ID, ALPR/VSR performance value ranges, transaction status and other criteria developed during the design phase.
REQ-185	The IPS shall record an image failure code to denote the reason for a vehicle’s license plate not being captured or an illegible image for all image-based transactions which are not processed. The codes for unprocessed images shall be agreed upon by CTRMA to ensure consistency in monitoring and reporting.
REQ-186	The IPS shall monitor and report on the quality of images received from the toll lanes in a manner that allows for the quick escalation of in-lane camera issues, ALPR issues, or vehicle framing issues.
REQ-187	The IPS shall store images in their native format (as received) as well as any ALPR information and transaction data provided by the Zone Controller.
REQ-188	The IPS shall process transactions/images in a First-In-First-Out (FIFO) manner.
REQ-189	The IPS shall provide for human/manual review of images with license plate numbers (LPN) and jurisdiction (state) input.
REQ-190	The IPS shall provide the capability to audit reviewers and track reviewer performance. If an optional automated method for image review is approved, the IPS shall provide the capability to audit the automated reviews and track the automated review performance
REQ-191	The IPS shall assign a confidence level or threshold to identify images that require manual review.

2.6.3 Trip Building

The TFH shall include a trip building system to logically group transaction records received from the roadside system(s) into trips. The TSI shall record all the Toll Point events and assemble them into complete Toll Point transactions from the roadside. The TSI shall then transmit all individual Toll Point transaction data to the TFH. The TFH receives individual Toll Point transaction data and then assembles this data into the logical trip and determines the appropriate toll rate. Refer to CTRMA’s trip building business rules in Appendix 10 for additional information.

Table 2-25: Trip Building Technical Requirements

ID	RULE
REQ-192	The trip building system shall support all applicable trip building business rules, as described in Appendix 10, Lane System Business Rules, and performance requirements, as defined in Appendix 7, Service Level Agreement.
REQ-193	The trip building system shall create trips consisting of one or many individual transactions based on facility, the matching images, transponder, and other available transaction information for each vehicle passing through the facility.
REQ-194	The trip building system shall assign a unique trip ID to each trip.

ID	RULE
REQ-195	Trips will be built based on a CTRMA user-configurable entry/exit plaza where a vehicle was detected (either AVI or LPN) in the Express Lane.
REQ-196	Trips may be based on AVI reads, LPN matches, or a combination of the two.
REQ-197	All trips created by the TSI-provided trip building process will be sent to CTRMA’s Data Platform system for final disposition, posting, and processing per the TFH to Data Platform Host transaction interface to be developed and approved by CTRMA during the design phase of this project.
REQ-198	The trip building system shall provide the capability to review, audit, and correct formed trips based on user-configurable conditions and selection criteria.
REQ-199	The trip building process shall include a user-configurable dwell or hold time wherein trips are not sent to CTRMA’s Data Platform System until this dwell or hold time has been met, allowing CTRMA to adjust, re-rate, and otherwise disposition trips.
REQ-200	The trip building process shall include a user-configurable processing time, is automatically adjusted based on current system conditions (e.g., failures), and is added to the dwell time.
REQ-201	The trip building process shall include a user-configurable lapse time to define the maximum travel time allowed for a trip.
REQ-202	The trip building system shall allow CTRMA to override toll rates on batches of trips based on facility, period, segments, and entry/exit combination.
REQ-203	Trip building is limited to a single facility and direction. Trips will not cross facilities.
REQ-204	The trip building system shall include a transponder-to-license plate correlation to improve trip building accuracy. Whenever this correlation determines that the transponder and license plate contained in any transaction based on vehicle identification processing, one of the transactions becomes an exception. The specific function and implementation of this filter will be finalized during the design phase.

2.6.3.1 Transaction Aggregation

Note: CTRMA will determine if Transaction Aggregation functionality shall be implemented.

Table 2-26: Transaction Aggregation Technical Requirements

ID	RULE
REQ-205	Provide a CTRMA configurable “switch” that allows existing facilities that are not trip-based to become trip based.
REQ-206	This switch will be at the facility level, where CTRMA can select the facility.
REQ-207	If this switch is turned “on”, then the selected facility will bundle/aggregate transactions from that facility into a trip.
REQ-208	The trip will be made up of all the transactions from the plazas on that facility where a vehicle was detected.
REQ-209	This trip will be formed after image review of the separate transactions so that LPN is known.

ID	RULE
REQ-210	If LPNs, or transponder numbers do not match in the transactions, they will not be bundled/aggregated into a trip.
REQ-211	The toll rate will be the summation of the toll rates applied to the transactions that are bundled/aggregated into the trip.
REQ-212	There will be a CTRMA configurable time limit around the transactions that are to be bundled/aggregated (i.e., only bundle/aggregate transactions that are within X number of minutes from beginning to end). These bundled/aggregated transactions are only one-directional.
REQ-213	The bundled/aggregated transaction will be sent to the Data Platform System as a single trip, with the summed-up toll rate.

2.6.3.2 Trip Review GUI

Table 2-27: Trip Review GUI Technical Requirements

ID	RULE
REQ-214	The trip building system shall include trip search criteria that include the following: <ol style="list-style-type: none"> 1. Date/Time 2. Facility 3. Direction 4. Lane ID 5. Plaza 6. Origin-Destination Pair 7. Transponder Number 8. License Plate Number 9. Trip ID 10. Transaction Number 11. Trip Type 12. Trip Status 13. Toll Rate 14. Vehicle Class
REQ-215	The trip building GUI shall include search results that shall be sortable and filterable by column headings on the search results screen.
REQ-216	The trip building GUI shall include a count of the total number of records returned that match the entered search criteria.
REQ-217	The trip building GUI shall provide for a trip detail drill down that contains the additional transaction information, at a minimum: <ol style="list-style-type: none"> 1. Transaction date/time 2. Transaction location (Facility, Plaza) 3. License plate/transponders read in each transaction 4. Link to image sets

ID	RULE
REQ-218	Authorized CTRMA users shall be able to select a single trip or a batch of trips from the search results and perform the following actions: <ol style="list-style-type: none"> 1. Re-rate trips 2. Adjust trips (change license plate, vehicle class, etc.) 3. Split trips 4. Merge trips 5. Write off trips
REQ-219	Authorized CTRMA users shall be to view the max rate (or highest rate), including travel times savings for a given time.

2.6.3.3 Toll Rate Assignment

Table 2-28: Toll Rate Assignment Technical Requirements

ID	RULE
REQ-220	The trip building system shall support applicable toll rate assignment business rules as described by Appendix 10, Lane System Business Rules, and performance requirements, as defined in Appendix 7, Service Level Agreement.
REQ-221	Toll rates shall be assigned to trips based on the price displayed on the VTMS before the entry to the facilities.
REQ-222	The trip building process shall determine the toll rate for each Express Lane trip based on the segment(s) traversed by the vehicle.
REQ-223	The assigned toll rate shall reflect the transaction type (e.g., valid AVI or Pay By Mail).
REQ-224	The toll rate assigned to a trip shall be the rate in effect per the DPE and displayed on the VTMS at the time the vehicle enters any Express Lanes facility or any segment thereof.
REQ-225	The TFH shall record and retain all toll rates and other messages exchanged with the VTMS for a minimum of three (3) months.
REQ-226	The TFH shall maintain a backup toll rate schedule based on the previous three (3) months of historical data, and it shall be applied as the default toll rate schedule in the event communication is lost between the TFH and DPE.
REQ-227	The TFH shall support preapproved manual override functionality for non-express lanes.

2.6.4 Reports

The TSI shall develop and deliver a reporting system to support roadside, the TFH, maintenance subsystems, and overall systems availability and performance reporting.

The TSI shall collaborate with CTRMA’s internal stakeholders and other third parties as directed by CTRMA for purposes of designing, developing, and testing transaction reconciliation reporting, which may include the comparison of reports from multiple vendors. For example, the TSI may be required to coordinate with CTRMA’s traffic and revenue consultant on which reports (and data elements) should be developed and used in support of contracted services provided to CTRMA. The SLAs shall govern report generation execution times and data output limits defined in Appendix 7, Service Level Agreement.

In addition to the TSI’s standard suite of reports, as defined in Section 2.6.4.1, Categories of Reports, and custom reports developed as part of Section 2.7.4, Report Development Workshops, the TSI shall deliver reports representative of items described in Appendix 14, Key Reports.

The TSI may utilize existing reports to satisfy the requirements of Appendix 14, Key Reports, if acceptable to CTRMA. The TSI will coordinate with CTRMA during the Reports Development Workshop to determine which reports may be satisfied by utilizing reports in the TSI’s current reporting suite, and any modification or new development required. The TSI shall provide a Reports Detailed Design Document to document the design as a result of the workshop.

The TSI shall provide a reporting system with the functionality of the reports scheduler to schedule automated reports delivered to a configured location.

Table 2-29: Report Technical Requirements

ID	RULE
REQ-228	The reporting system shall support all applicable reporting business rules in Appendix 10, Lane System Business Rules, and performance requirements, as defined in Appendix 7, Service Level Agreement.
REQ-229	Transaction and trip, reconciliation, maintenance, performance (e.g., SLAs), configuration management, asset management, operational (IPS) audit, and security reports shall all be available to CTRMA on a daily, weekly, and monthly basis. Report formats shall be developed and approved during the design phase of the project and shall include standard, (within limits) ad-hoc report generation capability, and dashboard reports.
REQ-230	The user interface shall provide the capability to select and review videos based on the timeframe, location (facility/plaza/lane), tag number, vehicle class, transaction number. The user interface shall allow the selected video to be replayed in real-time, in slow motion, frame by frame. The user interface will allow the user to “scroll” through the selected video with a pointing device (i.e., mouse).
REQ-231	The reporting system shall support full transaction-level reconciliation and audibility from the TSI-provided roadside, the TFH systems, and ETCS subsystems to externally connected external systems.
REQ-232	The reporting system shall provide the capability to schedule and deliver scheduled reports to the configured destination or be run on-demand.
REQ-233	The reporting system shall provide the capability for the user to specify the format of the report, for example, PDF, Excel, and CSV.
REQ-234	The reporting system shall perform the daily system checks to ensure system reports and automatically generated reports are complete and not missing any data.
REQ-235	The reporting system shall generate an alert when data is missing, or a report summarization has failed.
REQ-236	The reporting system shall allow for efficient export/extraction of large raw data sets for use by CTRMA’s engineering, finance, traffic, and revenue consultants, and other third parties as required by CTRMA for data analysis. Specific requirements for the method and format of these data extracts will be defined during the design phase of the project.

2.6.4.1 Categories of Reports

Detailed report requirements shall be defined during the requirements and design phases of the project. Report categories shall include, but are not limited to, the following:

2.6.4.1.1 Audit and Reconciliation Reports

Table 2-30: Audit and Reconciliation Reports Technical Requirements

ID	RULE
REQ-237	The required audit and reconciliation reports include the following, at a minimum: <ol style="list-style-type: none"> 1. Exception Reports 2. Interface and File Transmission Reconciliation Reports 3. Revenue Audit and Reconciliation 4. Transaction Audit and Reconciliation 5. User Access, Activity, and Data Modification Reports 6. Reconciliation Summary Report

2.6.4.1.2 Maintenance Reports

Table 2-31: Maintenance Reports Technical Requirements

ID	RULE
REQ-238	The required maintenance reports include the following, at a minimum: <ol style="list-style-type: none"> 1. Asset Value and Depreciation 2. Availability and Performance Statistical Reports 3. Emergency Maintenance 4. Equipment Health 5. Equipment Inventory and Tracking 6. Equipment Use, Failure, Warranty, and Repair History 7. Incidents Log 8. Scheduled Preventive Maintenance Tasks 9. Preventive Maintenance Activity 10. Response and Repair Times 11. Alarms History 12. Trend Analysis 13. Comparative Analysis 14. SLA Metrics 15. Equipment, Interface, Subsystem, and Total System Availability 16. Work Order Status and Tracking

2.6.4.1.3 Network Monitoring Reports

Table 2-32: Network Monitoring Reports Technical Requirements

ID	RULE
REQ-239	The required network monitoring reports include the following, at a minimum: <ol style="list-style-type: none"> 1. Uptime Chart 2. Activity Report 3. Managed Device Inventory 4. All Alerts 5. All Down Alerts 6. Network Health 7. Server Health 8. Server Performance 9. WAN Activity 10. Backup Monitoring 11. Preventative Maintenance

2.6.4.1.4 IPS Reports

Table 2-33: IPS Reports Technical Requirements

ID	RULE
REQ-240	The required IPS reports include the following, at a minimum: <ol style="list-style-type: none"> 1. Image Disposition Summary and Detail 2. Image Status Summary and Detail 3. Operational by Queue (including the current state of all transactions) 4. QA Reports 5. End-to-End Historical Reports (for total transactions processed) 6. Filter Reports 7. Image Review Performance-Detail Report 8. Image Code-off Summary Report 9. Image Rejections by User 10. User Statistics Detail and Summary Report 11. Rejected Images by Reviewer Report

2.6.4.1.5 Transaction and Trip Reports

Table 2-34: Transaction and Trip Reports Technical Requirements

ID	RULE
REQ-241	<p>The required transaction and trip reports include the following, at a minimum:</p> <ol style="list-style-type: none"> 1. Detailed Transactions and Trip reports that shall consist of all transactions received by the toll facility. These reports shall report daily, weekly, monthly, and yearly transactions and revenue by the facility. 2. Detailed transaction and trip report(s) shall be by facility/direction/lane and include the following fields, at a minimum: <ol style="list-style-type: none"> a. Transaction ID b. Transponder number(s) c. Transponder status d. Transponder agency e. Plate number, state, and type (as applicable) f. Image URLs g. Vehicle classification h. Toll rate i. Date/time j. Location (e.g., entry and exit plazas) k. Processing (workflow) status 3. Transaction and Trip Processing Reports, which includes the processing status (workflow) 4. Summary and detail of transactions/trips posted to the BOS accounts. Summaries are provided in daily, weekly, monthly, and yearly increments. 5. Transaction and Trip Adjustment Report, which includes before and after transaction details, modified by User ID and reason for the adjustment. 6. Transaction and trip type summary 7. Travel time report based on transponder reads/timestamps. 8. Reporting capability to quantify vehicles traveling in a contiguous trip across facilities for a given time 9. Reporting capability to quantify vehicles by the origin and destination in a contiguous trip across facilities, for a given time 10. Administrative reports <ol style="list-style-type: none"> a. Report scheduler b. Exempt vehicles c. Special programs

2.6.4.2 Automated and Ad-Hoc Data Extracts

In support of CTRMA’s consultants and auditors, the TSI shall provide a method for efficient and automated data extraction for data analysis and monitoring the performance of CTRMA’s express lanes and non-express lane facilities, and for future traffic and revenue studies. Data shall be made available to CTRMA’s consultants via an interface where possible, as described in Section 2.6.6, Interfaces. The format of the data required is described in the following Sections 2.6.4.2.1 through 2.6.4.2.4.

2.6.4.2.1 Transponder Data

- **Frequency:** Monthly (estimated)
- **Detail:** Individual Electronic Toll Collection (ETC) transactions recorded at plaza level
- **Method:** Direct access/interface to the ETCS for automated data extracts as needed

GANTRY LOCATION	PLAZAID	LANENUM	TRANSTMST	PLAZATRXID	AXLES	EXPECTEDAMOUNT	AGENCY	TAGID
Enfield NB	80		1 10/28/2018 00:00:14.395026000	5321XXXX	2	0.40	TxDOT	TEX.XXXY01
Enfield NB	80		1 10/28/2018 00:00:28.097047000	5321XXXX	2	0.40	TxDOT	TEX.XXXY02
Enfield NB	80		1 10/28/2018 00:01:05.507653000	5321XXXX	2	0.40	TxDOT	TEX.XXXY03
Enfield NB	80		1 10/28/2018 00:02:14.115648000	5321XXXX	2	0.40	TxDOT	TEX.XXXY04
Enfield NB	80		1 10/28/2018 00:03:33.087806000	5321XXXX	2	0.40	TxDOT	TEX.XXXY05
Enfield NB	80		1 10/28/2018 00:04:20.856466000	5321XXXX	2	0.40	TxDOT	TEX.XXXY06
Enfield NB	80		1 10/28/2018 00:04:45.703069000	5321XXXX	2	0.40	TxDOT	TEX.XXXY07
Enfield NB	80		1 10/28/2018 00:05:04.172022000	5321XXXX	2	0.40	TxDOT	TEX.XXXY08
Enfield NB	80		1 10/28/2018 00:05:23.862593000	5321XXXX	2	0.40	TxDOT	TEX.XXXY09
Enfield NB	80		1 10/28/2018 00:05:43.814022000	5321XXXX	2	0.40	TxDOT	TEX.XXXY10
Enfield NB	80		1 10/28/2018 00:06:26.834841000	5321XXXX	2	0.40	NTTA	TEX.XXXY11
Enfield NB	80		1 10/28/2018 00:06:58.071675000	5321XXXX	2	0.40	TxDOT	TEX.XXXY12
Enfield NB	80		1 10/28/2018 00:07:10.331035000	5321XXXX	2	0.40	TxDOT	TEX.XXXY13
Enfield NB	80		1 10/28/2018 00:07:41.599659000	5321XXXX	2	0.40	TxDOT	TEX.XXXY14
Enfield NB	80		1 10/28/2018 00:07:42.421811000	5321XXXX	2	0.40	TxDOT	TEX.XXXY15
Enfield NB	80		1 10/28/2018 00:07:43.176027000	5321XXXX	2	0.40	TxDOT	TEX.XXXY16
Enfield NB	80		1 10/28/2018 00:08:06.479063000	5321XXXX	2	0.40	TxDOT	TEX.XXXY17
Enfield NB	80		1 10/28/2018 00:08:25.128981000	5321XXXX	2	0.40	TxDOT	TEX.XXXY18
Enfield NB	80		1 10/28/2018 00:08:48.905841000	5321XXXX	2	0.40	TxDOT	TEX.XXXY19

Figure 2-16: Transaction Data

2.6.4.2.2 License Plate Data

- **Frequency:** Monthly (estimated)
- **Detail:** Individual Pay By Mail transactions recorded at plaza level
- **Method:** Direct access/interface to the ETCS for automated data extracts as needed

GANTRY LOCATION	PLAZAID	LANENUM	TRANSTMST	PLAZATRXID	AXLES	TOLLAMOUNT	PLATESTATE	PLATENUM	TAGAGENCYID	TAGID	AMOUNTDUE
Enfield NB	80		1 10/28/2018 00:01:12.967566000	5321XXXX	2	0.33	TX	XXXXXXXX01			
Enfield NB	80		1 10/28/2018 00:04:50.482555000	5321XXXX	2	0.33	TX	XXXXXXXX02			
Enfield NB	80		1 10/28/2018 00:06:52.715719000	5321XXXX	2	0.33	TX	XXXXXXXX03			
Enfield NB	80		1 10/28/2018 00:07:56.663478000	5321XXXX	2	0.33	TX	XXXXXXXX04			
Enfield NB	80		1 10/28/2018 00:08:00.623151000	5321XXXX	2	0.33	TX	XXXXXXXX05			
Enfield NB	80		1 10/28/2018 00:09:35.800410000	5321XXXX	2	0.33	TX	XXXXXXXX06			
Enfield NB	80		1 10/28/2018 00:10:06.027322000	5321XXXX	2	0.33	TX	XXXXXXXX07			
Enfield NB	80		1 10/28/2018 00:10:12.838303000	5321XXXX	2	0.33	TX	XXXXXXXX08			
Enfield NB	80		1 10/28/2018 00:14:19.386830000	5321XXXX	2	0.33	TX	XXXXXXXX09	102	TEX.XXX01	0.25
Enfield NB	80		1 10/28/2018 00:15:15.635741000	5321XXXX	2	0.33	TX	XXXXXXXX10			
Enfield NB	80		1 10/28/2018 00:18:03.455570000	5321XXXX	2	0.33	OK	XXXXXXXX11	103	TEX.XXX02	0.25
Enfield NB	80		1 10/28/2018 00:21:48.676126000	5321XXXX	2	0.33	TX	XXXXXXXX12			
Enfield NB	80		1 10/28/2018 00:21:50.919753000	5321XXXX	2	0.33	TX	XXXXXXXX13			
Enfield NB	80		1 10/28/2018 00:22:30.301762000	5321XXXX	2	0.33	TX	XXXXXXXX14			
Enfield NB	80		1 10/28/2018 00:23:37.247370000	5321XXXX	2	0.33	TX	XXXXXXXX15	103	TEX.XXX03	0.25
Enfield NB	80		1 10/28/2018 00:24:58.335001000	5321XXXX	2	0.33	TX	XXXXXXXX16			
Enfield NB	80		1 10/28/2018 00:25:09.171669000	5321XXXX	2	0.33	TX	XXXXXXXX17	101	TEX.XXX06	0.25
Enfield NB	80		1 10/28/2018 00:28:22.136695000	5321XXXX	2	0.33	TX	XXXXXXXX18			
Enfield NB	80		1 10/28/2018 00:30:39.512951000	5321XXXX	2	0.33	TX	XXXXXXXX19			

Figure 2-17: License Plate Data

2.6.4.2.3 Transactions and Revenue Data

- **Detail:** Daily transactions and estimated revenue by AVI and video by the plaza
- **Method:** Daily reports (emailed)
- Current transaction and revenue data format

Plaza ID	Plaza Name	AVI Count	AVI Estimated Revenue	PBM Count	PBM Estimated Revenue
80	Enfield NB	1387	485.45	1015	537.95
81	Far West NB	778	272.3	699	370.47
82	Parmer SB	500	175	409	216.77
83	RM2222 SB	1307	457.45	1045	553.85
	Total	3972	1390.2	3168	1679.04

Figure 2-18: Transactions and Revenue Data

2.6.4.2.4 Revenue Recovery Statistics

- **Detail:** Daily revenue data for transponder, I-Toll, and video transactions
- **Method:** Daily reports (emailed)
- Current revenue recovery data format

DAY_MONTH	Day	Is_WeekDay	HR24	MINUTES	ID	TOT_TRANS	TAG_TRANS	PENETRATION_%
01-FEB-2019	5	1	0	0	01-FEB-2019_0_0	38.00	11.00	29.00
01-FEB-2019	5	1	0	15	01-FEB-2019_0_15	24.00	6.00	25.00
01-FEB-2019	5	1	0	30	01-FEB-2019_0_30	27.00	3.00	11.00
01-FEB-2019	5	1	0	45	01-FEB-2019_0_45	17.00	4.00	24.00
01-FEB-2019	5	1	1	0	01-FEB-2019_1_0	14.00	3.00	21.00
01-FEB-2019	5	1	1	15	01-FEB-2019_1_15	7.00	2.00	29.00
01-FEB-2019	5	1	1	30	01-FEB-2019_1_30	8.00	3.00	38.00
01-FEB-2019	5	1	1	45	01-FEB-2019_1_45	8.00	2.00	25.00
01-FEB-2019	5	1	2	0	01-FEB-2019_2_0	11.00	2.00	18.00
01-FEB-2019	5	1	2	15	01-FEB-2019_2_15	11.00	3.00	27.00
01-FEB-2019	5	1	2	30	01-FEB-2019_2_30	12.00	5.00	42.00
01-FEB-2019	5	1	2	45	01-FEB-2019_2_45	3.00	1.00	33.00
01-FEB-2019	5	1	3	0	01-FEB-2019_3_0	9.00	4.00	44.00
01-FEB-2019	5	1	3	15	01-FEB-2019_3_15	7.00	2.00	29.00
01-FEB-2019	5	1	3	30	01-FEB-2019_3_30	9.00	1.00	11.00
01-FEB-2019	5	1	3	45	01-FEB-2019_3_45	7.00	2.00	29.00
01-FEB-2019	5	1	4	0	01-FEB-2019_4_0	9.00	2.00	22.00
01-FEB-2019	5	1	4	15	01-FEB-2019_4_15	7.00	1.00	14.00
01-FEB-2019	5	1	4	30	01-FEB-2019_4_30	21.00	0.00	0.00

Figure 2-19: Revenue Recovery Statistics

2.6.5 System Security and Transaction Audit

The TFH shall provide audit trails and audit functionality for all transaction/trip processing activity that is performed by the system either automatically or by users. A screen/report shall be provided that allows authorized users to understand all changes made to a transaction/trip and the User ID associated with these changes. System changes shall be included with an appropriate User ID. This screen/report will include selection criteria such as period, location (facility, plaza), and other criteria such that specific system audits can be performed.

The TSI shall provide technical resources, ad-hoc reporting support, and TSI facilitated meetings to explain system functionality to CTRMA’s designated auditors. This support shall be addressed with the highest priority and may include working with third parties.

Table 2-35: System Security Technical Requirements

ID	RULE
REQ-242	Only authorized personnel with assigned User IDs and passwords shall have access to computers, applications, and system information on the ETCS computers and network.
REQ-243	The system shall provide controlled user access that includes sign-on facilities, permission control, and various levels or roles for access to system control, files, directories, and application software, including logs of user account modification (e.g., add, delete, changes) made available for review and audit.
REQ-244	The system shall support changes by CTRMA to the access levels and personnel designated to those roles.
REQ-245	The system shall include features to assure the security and integrity of all data collected and processed by the system.
REQ-246	The system shall employ redundancy as needed to meet the required availability and functionality requirements and to protect against data loss and data corruption. Communication transmissions to and from the system shall employ a reliable means of confirming that data is accurately sent and received.
REQ-247	If not using SaaS or cloud-based platforms, the system shall protect against data loss caused by equipment malfunction and failure, inadequate data storage capacity, communication loss, power outage, voltage drop or surges, extreme temperatures, deletion by users or other forms of human error, and cyber-attacks (i.e., rogue users/hackers, virus attacks).
REQ-248	Throughout all levels of the system, the TSI shall employ an integrated and comprehensive anti-spam and anti-virus protection system.
REQ-249	The TSI shall provide a secure firewall that protects all aspects of the system.
REQ-250	Any modifications to data (records) and all databases shall be recorded to a retrievable chronological log that includes notations to support system audits.
REQ-251	The TSI shall not disclose, distribute or make available to any third party the names, addresses, or any other personal identification information of customers without their express consent except as required to comply with laws or legal processes served for CTRMA.
REQ-252	Any vulnerabilities shall be immediately reported to CTRMA along with any recommended patches, upgrades, and enhancements to the system.
REQ-253	The TSI shall perform periodic cybersecurity testing and vulnerability assessments to be planned and coordinated with CTRMA. Vulnerability testing shall be performed monthly, as well as with every new software release or addition of new network equipment.
REQ-254	The TFH shall provide audit trails and audit functionality for all transaction processing activity that is performed by the system either automatically or by users.
REQ-255	A screen/report shall be provided that allows authorized users to understand all changes made to a transaction and the User ID associated with these changes.
REQ-256	System changes shall be included with an appropriate User ID.

ID	RULE
REQ-257	This screen/report shall include selection criteria such as time, location (facility, plaza), and other criteria such that specific system audits can be performed.
REQ-258	The TFH shall include functionality to audit all roadside transactions.
REQ-259	A GUI shall be provided that allows authorized users to select a date, time, location (facility, plaza), and other criteria to audit transactions from the roadside and received by the TFH.
REQ-260	The results of all roadside transaction audits shall be included in reports that contain relevant roadside information and relevant TFH information available in Excel or CSV formats.
REQ-261	<p>The specific data elements that will be contained in these audit reports shall be agreed to during the design phase but shall include the following, at a minimum:</p> <ol style="list-style-type: none"> 1. Roadside Transaction (sent) <ol style="list-style-type: none"> a. Date and time b. Location (facility, plaza) c. Transaction ID d. Transponder numbers e. LPN 2. TFH (received) <ol style="list-style-type: none"> a. Date and time b. Location (facility, plaza) c. Transaction ID d. Transponder numbers e. LPN
REQ-262	These audit reports shall include summary numbers as well that indicate the numbers of transactions sent for the selection criteria and the number of transactions received for the selection criteria.
REQ-263	The TSI shall provide support for audits requested by CTRMA.
REQ-264	The TSI shall arrange and perform an annual SSAE 16 (SOC 1) Type II audit for submittal to CTRMA, which shall be considered part of the work involving no additional cost. The audit shall focus on security (including delineation of responsibility), availability, processing integrity, confidentiality, and privacy. The TSI shall address and correct any deficiencies discovered during the audit.
REQ-265	All system administrators shall have two separate user accounts. One will be a standard user-level account to be used for regular activities that do not require root or administrator-level permissions. The other account shall be a root or administrator-level account, which shall only be used for activities that require root or administrator-level permissions.
REQ-266	The TSI shall provide, at their cost, an annual information security risk assessment to be performed by a third party approved by CTRMA. The TSI shall provide the assessment results to CTRMA. The first risk assessment shall be completed prior to system integration testing.
REQ-267	The TSI is responsible for correcting all toll system security deficiencies at the TSI's cost and ensuring that all security risks are mitigated to a level that is acceptable to CTRMA.

ID	RULE
REQ-268	The TSI shall maintain a development and test environment, separate from the production system, for any systems development and testing needs (i.e., there shall always be a separation of production and development environments).
REQ-269	The TSI shall implement encryption of all data at rest and in transit, exclusive of RFID communications. This encryption shall meet the most recent National Institute of Standards and Technology (NIST) standards, the most current being detailed in NIST Special Publication 800-175B Revision 1.

2.6.6 Interfaces

The TSI shall provide interfaces designed to exchange data between the TFH and CTRMA’s DPS and third-party service providers. As part of the requirements phase for the project, the TSI shall define a list of interfaces and related requirements for the project. During the design phase, the TSI shall develop appropriate ICD’s for the review, comment, and approval by CTRMA.

These ICDs shall fully describe the interfaces (or APIs if appropriate), including file formats, message delivery guarantee structure and receipt acknowledgment, error checking and handling, retransmission procedures, archiving, and other related specifications.

These ICDs shall address the physical, functional, and performance aspects of all interfaces. Data flow diagrams shall be used to illustrate the objectives of the interface, and any proposed security protection consistent with the public exposure of the interface data shall be described.

The TSI shall prepare and maintain for the duration of the contract an interface specification catalog. This catalog will include, at a minimum, every interface name, its purpose, who builds/built it, who maintains it, latest ICD, or Web Services Description Language (WSDL) name/version and system location, and primary contacts. Additionally, the TSI shall provide the methodology for keeping the catalog and ICD/WSDL versions current.

The TFH shall be required to interface with the following external (non-TSI) systems:

1. **The CTRMA DPS:** The TSI shall develop an Application Programming Interface (API) that will allow CTRMA’s DPS system (and perhaps other systems) to interface with the TFH. This API shall be fully documented in an ICD, and CTRMA will review and approve the ICD, and therefore the functionality of the API.
2. **Advanced Traffic Management System (ATMS) Software Interface:** The ETCS/TFH shall interface with CTRMA’s Automated Traffic Center software (Lonestar) based on the Center-to-Center (C2C) ICD, and C2C Toolkit found at the following:
<https://www.txdot.gov/business/resources/engineering-software.html>

The interface will be modified to include the exchange of toll pricing information and other changes as defined during the design phase of the ETCS and agreed to by the TSI and CTRMA. The C2C ICD allows for the sharing of data between the ETCS and ATMS systems, including pricing information from the ETCS to the ATMS.

3. **Data Extract Interface for CTRMA’s Consultants and Auditors:** The TSI shall provide a method (e.g., API or similar) for CTRMA and their consultants to connect to the ETCS and/or TFH data sources for efficient and automated data extracts. The TSI shall coordinate with CTRMA and consultants to determine an acceptable method during the design phase of the ETCS. Currently, this data is downloaded from the SOAP (CTRMA’s FTP Server) Interface using an R-Script. Presently the process involves downloading the data in XML format and converting it into CSV format.

2.6.7 Express Lanes User Interface (ELUI)

The TSI shall provide an application (preferably web-based) to be operated by CTRMA’s Traffic and Incident management staff as well as TSI support staff to monitor and manage all aspects of CTRMA’s express lanes. The ELUI provides a user interface to the DPE.

Table 2-36: ELUI Technical Requirements

ID	RULE
REQ-270	The Express Lanes User Interface (ELUI) shall support applicable business rules in Appendix 10, Lane System Business Rules, and performance requirements, as defined in Appendix 7, Service Level Agreement.
REQ-271	The ELUI shall allow users to review and edit configurations wherever possible for all Express Lane inputs and calculations required for dynamic pricing, rate management, trip building, and all other Express Lane related processes.
REQ-272	The ELUI shall provide a series of interactive dashboards providing information on key express lane operation functions, including an interactive map providing clickable icons of all Express Lane equipment, and dashboards for rate management, historical usage, pricing, and trip building.
REQ-273	All ELUI dashboards, maps, charts, and graphs shall allow users to drill down to detailed data for all aspects of the Express Lane equipment.
REQ-274	The ELUI shall include an interactive map allowing users to select system components and view real-time status for current rates, Microwave Vehicle Detection (MVD) status, level of service, and access to Express Lane CCTVs.
REQ-275	The ELUI interactive map shall allow users to filter (show/hide) any combination of express lane equipment at one time.
REQ-276	The ELUI interactive map shall allow users to select equipment and provide live video feeds within the ELUI application.
REQ-277	The ELUI interactive map shall allow users to view the current Level of Service (LOS) for each MVD selected.
REQ-278	The ELUI interactive map shall allow users to verify status (online/offline) for any Express Lane component.
REQ-279	The ELUI interactive map shall allow users to view all VTMS, including current rates and options for rate override.
REQ-280	The ELUI rate management dashboard shall allow users to review information about current rates and Express Lane and General-Purpose Lane performance, including volume, speed, and LOS.

ID	RULE
REQ-281	The ELUI rate management dashboard shall use a combination of maps showing the performance of Express Lane segments and LOS by segment, speed/volume status gauges, and time-based volume graphs.
REQ-282	The ELUI historical usage dashboards shall provide data on various data points, including a history of throughput, rates, speed, and LOS.
REQ-283	The ELUI pricing dashboard shall allow users to view pricing data for viewing historical pricing and to perform trend analysis.
REQ-284	The ELUI shall provide users the ability to manage all aspects of Express Lane pricing, including, at a minimum, the configuration of input parameters used for pricing algorithms.
REQ-285	The ELUI shall allow users the capability to search and review historical dynamic pricing schedules and details for each period.
REQ-286	The ELUI shall allow users to manage Time of Day (TOD) pricing schedules, including the ability to create, edit, apply, deactivate, and review (current and historical) TOD pricing schedules.
REQ-287	The ELUI shall allow users to define rates and start/end dates and times for TOD pricing schedules.
REQ-288	The ELUI shall allow users to review trip processing data, including current trip building status, and processing data
REQ-289	The ELUI shall allow users to view trip building performance and throughput data, including completed, and pending trip counts, ALPR, and image review stats related to the trip building process.
REQ-290	The ELUI shall allow users to review and edit trip building configurations, including processing time, lapse time, dwell time, ALPR, and auto-match levels.
REQ-291	The ELUI shall allow users to adjust trip fares for one or more trip segments, including partial and full (write-off) adjustments of any amount.

2.6.8 Toll Fare Schedule Management (for Non-Express Lanes Facilities)

The TFH shall provide Toll Fare Schedule Management to set the toll rates for all non-express lanes facilities according to the current CTRMA toll rates.

Toll Fare Schedule Management shall have a simple interface to enable authorized users to add, remove, import, export, and modify the toll fare schedules. Toll fare schedules shall include rates by vehicle classification, payment type, time of day, day of the week, and time of year using a configurable date range.

2.6.9 Servers and Racks

CTRMA anticipates the expansion of their current data platform infrastructure, including servers, network, and storage. The TFH shall support the services of this program, including but not limited to, the following:

1. Design and implementation of the ETCS
2. Transitioning the existing ETCS to the new ETCS
3. Implementing the ETCS on new facilities during the contract term
4. Ongoing maintenance of the ETCS

Table 2-37: Servers and Racks Technical Requirements

ID	RULE
REQ-292	The ETCS solution shall include all proposed or existing cabinets, enclosures, servers, storage systems, workstations, cabling, power distribution units, and any ancillary equipment necessary to provide a complete system that meets the requirements of this RFP.
REQ-293	Any proposed TFH subsystem or component, including servers and all associated hardware elements, shall be of the latest commercially available design and shall incorporate standard commercially available products and components in production at the time of design/development and supported by manufacturers.
REQ-294	The ETCS shall include proven configurations that support future upgrades to system processors, memory components, and storage systems.
REQ-295	The TFH shall be capable of load-balancing all requests and tasks across available processing platforms and share shared Network Attached Storage (NAS) or other storage technologies.
REQ-296	The ETCS shall include a scalable solution that supports the transaction levels indicated in Appendix 15, Traffic Projections.
REQ-297	For system sizing, the ETCS should support the storage of all required transaction data, including 100% of all transactions being image-based, as defined in Appendix 12, Data Retention Schedule.
REQ-298	The ETCS shall scale to support the estimated annual transaction growth (above) with no significant hardware, software, building floor space, HVAC, or infrastructure changes.
REQ-299	All hardware and equipment supplied for this project, excluding consumable materials (i.e., material that needs continuous replenishment), shall support all requirements contained herein, including established SLAs, and shall adhere to specified warranty and service contracts requirements.
REQ-300	All hardware, equipment, devices, supplies, and materials furnished under the contract shall be new, off-the-shelf, and field-proven unless otherwise specified.
REQ-301	The ETCS shall meet American National Standards Institute (ANSI) Telecommunications Industry Association (TIA) data center standard TIA-942.

2.6.9.1 Data Storage

Table 2-38: Data Storage Technical Requirements

ID	RULE
REQ-302	The ETCS shall include an efficient solution for storing and accessing data and files for the TFH at both the primary and the Disaster Recovery sites. The TSI shall follow the Data Retention Guidelines, as defined in Appendix 12, Data Retention Schedule, for all data retained by the TFH.
REQ-303	The ETCS shall maintain and store files for the following: <ol style="list-style-type: none"> 1. Transactional data 2. Lane and TFH configuration and executable data including version numbers, date and time entered in the production system 3. Toll facility toll rates and toll schedules 4. TVL and other data versions, including updates by date and time received 5. Vehicle and license plate image files including toll transaction ID link, location (facility, plaza) code, date, and time 6. Security access authorization data by date and time built 7. System logs from the TFH servers 8. Exempt vehicle lists
REQ-304	The ETCS shall store all toll transaction records, toll lane events, maintenance messages, and work order records, as outlined in Appendix 12, Data Retention Schedule.
REQ-305	The ETCS shall provide authorized users the capability to access the above data through a GUI for display and to generate reports.
REQ-306	The ETCS shall make at least seven (7) years of the above data available online and for display and reporting in the TFH subsystems, and as outlined within Appendix 12, Data Retention Schedule.

2.6.10 Software

The following sections provide information about the software as related to the TFH.

2.6.10.1 *Software Development Plan*

The TSI will provide a Software Development Plan (SDP) describing the TSI’s plans and procedures for their software development effort. The SDP shall detail methods to be used and the approach to be followed for each activity and resource. The SDP should document all processes applicable to software development and reference specific standards, methods, tools, actions, and responsibilities associated with the development of all software required of the ETCS. The SDP should include the following:

1. SDP introduction and overview
2. Referenced documents
3. Identification of all software and software products to which the SDP applies
4. System overview, including system and software architecture
5. Additional requirements and constraints such as security, methods, standards, interdependencies
6. Organization and resources

7. Software development approaches, standards, and methodology
8. Incremental development approach, planning, and management/oversight
9. Software requirements analysis
10. Unit integration and testing
11. Component integration and testing
12. Software risk management
13. Approach to requirements traceability
14. Process for maintaining all software licenses, including third-party COTS

Table 2-39: Software Technical Requirements

ID	RULE
REQ-307	The proposed operating systems and databases shall be currently supported versions with a documented upgrade path from the TSI.
REQ-308	For all COTS-based products implemented in support of the ETCS, licensing and renewals shall be the responsibility of the TSI.

2.6.10.2 *Operating System*

Table 2-40: Operating System Technical Requirements

ID	RULE
REQ-309	Unless the database solution is delivered as a service (SaaS), the operating system for the TFH server(s) shall be COTS multi-user, multi-tasking, and shall be the previous version from current if the latest version/release date is less than twelve (12) months earlier than the Proposal submittal date.
REQ-310	The proposed operating system shall have COTS maintenance support services for the term of the contract.
REQ-311	The proposed operating system shall have an installed base that ranks in the top three for the selected platform supporting an enterprise-class database.

2.6.10.3 *Database Management System*

Table 2-41: Database Management System Technical Requirements

ID	RULE
REQ-312	The TSI Database Management System (DBMS) version/release date shall be the previous version from current if the latest version/release date is less than twelve (12) months earlier than the Proposal submittal date.
REQ-313	The selected DBMS shall have a published upgrade path and support upgrades to the operating system, applications, memory, disk drives, and processors.

2.6.10.4 System Failover and Recovery

Table 2-42: System Failover and Recovery Technical Requirements

ID	RULE
REQ-314	If the TFH is not deployed within the CTRMA-provided facilities (e.g., the CTRMA TIM Center and the CTRMA offices), CTRMA requires the TFH hosting location(s) to adhere to the data center Tier 2 (or higher) power, cooling, redundancy, and security requirements. A Tier 2 (or higher) data center standard must comply with the requirements defined by the Telecommunication Industry Association (TIA) 942.
REQ-315	The location(s) where the TFH(s) are implemented shall be equipped with appropriate power and network connectivity to ensure a successful transition from the primary TFH location to a secondary TFH location. This transition must be accomplished within the required timeframe to support TFH availability and performance SLAs, as described in Appendix 7, Service Level Agreement.
REQ-316	
REQ-317	
REQ-318	
REQ-319	If the TFH is implemented as an active-active solution, the “Failover” procedures shall not take longer than eight (8) hours.
REQ-320	The TSI’s design shall ensure that no data captured/created in the facilities is lost or otherwise compromised when a TFH fails and/or is brought back to full operation.
REQ-321	The TFH locations shall have the appropriate networking infrastructure to support the bandwidth and operational requirements.

2.6.11 Data Backup and Recovery

Table 2-43: Data Backup and Recovery Technical Requirements

ID	RULE
REQ-322	The TSI shall provide an automated capability to back up the TFH daily.
REQ-323	The TSI shall annually demonstrate a successful restoration from backup.
REQ-324	This backup process shall include a scheduled process for both full and incremental backups.
REQ-325	Archived data shall be available to CTRMA within 24 hours of a CTRMA request.
REQ-326	All transactional data (including violation images) shall be retained per the CTRMA data retention policy, and then archived to permanent long-term storage only after the data retention time has expired. Refer to Appendix 12, Data Retention Guidelines.
REQ-327	When online disk space utilization reaches a user-configurable high percent of disk capacity, a message shall be transmitted to MOMS.

ID	RULE
REQ-328	The deletion of data that has reached its configured expiration timeframe or has been successfully archived shall be automatic without the need for user intervention. It shall generate a message transmitted to MOMS.

2.7 PROJECT MANAGEMENT

The following sections provide information about system development and project management Scope of Work.

2.7.1 Project Schedule

The TSI shall prepare and submit a detailed project schedule based on a work breakdown structure that includes all tasks, activities, and milestones related to the requirements gathering, design, development, procurement, installation, testing, training, and deployment of the proposed system. The schedule shall contain all the detailed discrete work packages and planning packages (or lower-level tasks/activities) networked with necessary dependencies to support project events. The TSI shall maintain the project schedule in Microsoft Project format (Microsoft Office 2016 or newer). The TSI shall identify all milestones and events, starting with the Notice to Proceed (NTP), to the end of the implementation phase, culminating with the final Operational Acceptance Test (OAT).

The TSI’s Proposal shall include a preliminary event-driven project schedule. The schedule shall be updated, and resource loaded following NTP to baseline the schedule by including unknowns and any changes during negotiation. All subsequent schedule updates shall be made to the revised baseline for the duration of the project. The TSI shall submit the project schedule per Appendix 13, Project Deliverable Schedule. The TSI shall update and make the project schedule available to CTRMA every month. The TSI shall also submit an updated version of the project schedule as part of the monthly progress report, described in Section 2.7.2, Regular Project Meetings.

The project schedule shall include activity start dates and durations, milestones dates, predecessor and successor dependencies, resources by name, and a critical path representing activities without any slack. The project schedule shall provide for the CTRMA documentation/deliverable review cycles that include the following:

1. The initial TSI submission of the documentation
2. CTRMA’s review and comment on the documentation
3. The TSI’s update of the documentation per CTRMA’s review comments
4. The subsequent second CTRMA review and comment on the documentation, if needed

A project schedule of documentation deliverables shall include a spreadsheet updated weekly for submittals in a two-week look ahead, and in real-time for submittals sent to CTRMA or received from CTRMA. The project schedule shall reflect each document submittal in whole and sections as agreed upon for CTRMA review.

At least monthly, the project schedule shall be submitted to CTRMA in Microsoft Project format with a PDF file and associated narrative with the following updates:

1. The project schedule shall provide the completion status of all tasks, activities, and milestones (e.g., deliverable submittal, project review meeting).
2. The project schedule shall provide all task activities resource loaded by name, and resource reports generated to demonstrate staff is not over-allocated across all tasks.
3. The project schedule shall identify tasks, activities, or milestones that are behind schedule. For example, if the preparation of a deliverable has expended 60% of the scheduled completion time while the completion percentage is only at 50%, then this deliverable is behind schedule. If a recovery schedule cannot prevent a project completion delay, the TSI shall provide a risk matrix/register with a mitigation strategy for critical path tasks and activities. Near-critical path analysis shall be accomplished as well.
4. The TSI shall provide version control with project schedule updates.

All scheduled tasks for the project schedule shall include at a minimum:

1. WBS number
2. WBS name
3. Resources performing the task activity
4. Subsystem affected
5. Task duration (includes start to finish of activities to complete a task)
6. Planned versus actual time at the start of the task
7. Predecessors and successors

2.7.2 Regular Project Meetings

Monthly project progress meetings shall be held at a location agreed and approved by CTRMA and shall follow a defined agenda. The TSI shall submit a progress report and a meeting agenda to CTRMA at least two (2) business days before the scheduled meeting.

Prior to any CTRMA system/network changes, which is defined as needed software updates to the system(s) or communication network updates, the TSI shall obtain CTRMA's review and approval. Changes to the system/network presented within the monthly project progress meetings without having first gone through the processes defined in the TSI's Change Management Plan (described in Table 2-44: Program-Level Document) shall not be approved.

The progress report and agenda shall include but not be limited to the following:

1. Updated project schedule showing progress since the previous meeting and including any proposed changes from the latest approved project schedule.
2. Completed work descriptions and the percentage complete for each task in progress.
3. Identification of all critical path tasks.
4. Risk/issue matrix changes, including associated recommended mitigation/resolution strategies or contingency plans intended to avoid potential delays.
5. Report on testing activities, including status and overview of defect tracking results (when applicable).

6. Descriptions of any pending and proposed change orders, or if any change order work is in progress, the status of the associated work.
7. Accomplishments during the reporting period.
8. Six (6) week look ahead work plan for activities to be accomplished on the project.
9. Updated action items list providing the status of the open action items, identifying and explaining action items that can be closed, and documenting new action items resulting from the discussion of outstanding issues and concerns. The action items list shall contain both the open action items assigned to CTRMA and the open action items assigned to the TSI.
10. Copy of the approved final minutes of the previous meeting.

Other project meetings shall be required to address specific issues and tasks. The TSI shall perform the following:

1. Coordinate date and time with the CTRMA Project Manager and distribute notices of the project meeting by email and post them on the approved project document management, sharing, and distribution cloud application.
2. Prepare the agenda in coordination with the CTRMA Project Manager.
3. Attend the meeting with all required staff in attendance or present by teleconference.
4. Prepare draft minutes of the meeting, with decisions and action items noted, and forward them to the CTRMA Project Manager immediately following (the day of) the meeting.

2.7.2.1 Project Kick-off and Work Progress

A project kick-off meeting shall be held between CTRMA and the TSI within thirty (30) days of the project NTP. At this meeting, all appropriate lines of communication for both oral and written correspondence shall be established. Appropriate methods for documenting meetings, telephone conversations, and other communications shall be defined. The project schedule shall be reviewed in detail and refined, as necessary.

The TSI shall prepare and submit to CTRMA monthly progress reports on the status of all-major items and activities. The progress report shall include an updated project schedule.

Project progress meetings shall be conducted monthly at the CTRMA offices, at a schedule to be proposed by the TSI and accepted by CTRMA. The purpose of these meetings shall be to monitor progress, discuss design issues, and plan for installation, testing, and transition.

The TSI shall allow CTRMA to conduct periodic inspections of the software development effort, including reviewing the status of source code. These periodic inspections include an on-site review at the TSI's development facility. The inspections may include an actual review of files with the TSI present, reviewing file size, the number of lines, work completed, and witnessing unscripted and unofficial testing of incremental development versions of the software. These periodic inspections could occur monthly or at some other frequency to be defined by CTRMA.

2.7.2.2 Workshops

The TSI shall conduct monthly workshops with appropriate stakeholders to review all submissions, validate system requirements, design approach and design, report formats, and other issues requiring coordination between CTRMA and the TSI. Whenever possible, these workshops should be scheduled in conjunction with project progress meetings. With CTRMA's approval, some workshops may be conducted via conference call.

2.7.3 Program-Level and Project-Level Documentation

The services solicited by this RFP include not only the transition to a new ETCS but also a phased implementation of this new ETCS to new facilities as they rollout. Because of the nature of this program, CTRMA requests the following two segments of documents:

- Program-Level Documentation, which includes a Program Management Plan (PMP), and
- Project-Level Documentation

The PMP shall consist of several program-level documents to be provided only once during the entire program and updated as needed. CTRMA anticipates minimal changes required throughout the program to these core documents. However, the TSI shall provide updates to the program-level documentation for each Work Authorization when required.

The TSI shall submit updated or amended program-level documentation with each Work Authorization to reflect changes required for each transitioned or newly installed facility, along with the required project-level documentation.

Project level documentation unique to each facility (e.g., as-builts, test reports, transition/install plans) shall be provided for each Work Authorization.

The program-level documentation is detailed in Table 2-44: Program-Level Documentation. The project-level documentation is detailed in Table 2-45: Project-Level Document.

2.7.3.1 Plans and Requirements

All plans and documentation shall be submitted in the English language to CTRMA electronically through a secured document management system. Refer to Section 2.7.6.5, Online Document Sharing and Document Management System, for more information.

All plans and documentation shall be submitted to CTRMA for review and acceptance. Plans and other documentation shall be submitted to allow time for a minimum of two iterations of the CTRMA review/TSI revisions to be completed and still adhere to the targeted final document deliveries identified by the TSI and approved by CTRMA. Any need for resubmittal shall not be a cause for delay in completing the project following overall project milestones. Acceptance of documents shall not relieve or limit the TSI's responsibility to provide an ETCS in full compliance with the contract. If corrections or improvements are requested, the TSI shall resubmit the plans and documentation until the plans and documentation are fully accepted.

In addition, CTRMA has the right to reject and request resubmittal of any documentation that contains quality issues (i.e., multiple errors related to spelling, grammar, and formatting).

Deviations from the RFP requirements that may be contained within TSI submitted documents, even though CTRMA may accept the document, shall not have the effect of modifying contract requirements. Only specific requests to CTRMA from the TSI for waivers or specification changes that are formally accepted by CTRMA will change requirements in the contract.

Appendix 13, Project Deliverable Schedule, lists the deliverables that the TSI is required to prepare and submit during the project, including the required submission date and duration of review periods by CTRMA.

2.7.3.1.1 Program Management Plan

A Program Management Plan (PMP) shall be submitted to CTRMA, which shall reflect that the TSI follows the processes and tools consistent with the most recent and applicable Project Management Institute’s (PMI) Project Management Body of Knowledge (PMBOK). The PMP shall include a description of the management techniques to be used during all phases of the project.

The TSI shall develop and submit to CTRMA for review and approval of a PMP describing the overall management, staffing, and measurable controls used to meet the requirements contained herein. The TSI shall submit the PMP in the initial documentation package per Appendix 13, Project Deliverable Schedule.

Since this program shall be rolled out over time for existing facilities and new construction, the PMP shall address several projects that could have different timelines and teams. The following documents provide scope information for the initial project and subsequent Work Authorizations (covered under this contract) and shall not need to be resubmitted with each project.

These documents that make up the PMP include, at a minimum, the documents listed in Table 2-44: Program-Level Documentation. For a full list of required documents, refer to Appendix 13, Project Deliverables Schedule.

Table 2-44: Program-Level Documentation

Document	Description
Master Project Schedule	Provides the initially projected activity dates used as a baseline for comparing the actual, achieved dates, and measuring progress.
Roles and Responsibilities	Provides information about the responsibilities of each role for the project team for the program and includes an Organizational Chart. Refer to Section 2.7.6.3, Staffing and Organizational Chart, for more information.
Scope Management Plan	Provides the tasks required to complete the project while excluding all the work/tasks that are out of scope.
Quality Management Plan	Provides information about the processes and procedures that ensure the QA/QC program functions as an integral part of the project. Refer to Section 2.7.5, Quality Assurance/Control Program for more information.

Document	Description
Communication Management Plan	Provides information that details the communications needs and expectations for the entire program.
Requirements Management Plan	Provides information about the defining, documenting, analyzing, prioritizing, and managing of the requirements of the project.
Change Management Plan	Provides information about the activities and roles to manage and control change during the execution and control stage of the project.
Configuration Management Plan	Provides information about defining, documenting, controlling, implementing, accounting, and auditing of changes to the various components of this project. Refer to Section 2.7.5.2, Configuration Management, for more information.
Risk Management Plan	Provides information about the methods to identify, track, and mitigate areas of risk, including cost. Refer to Section 2.7.7, Risk Management, for more information.

This PMP shall be a living document, and as such, shall be updated periodically to reflect any changes to the program, and submitted to CTRMA for review and approval. The TSI shall maintain and keep current all incorporated individual plans, procedures, and processes that comprise the PMP for the duration of the contract.

2.7.3.1.2 Project-Level Documentation

The Project-Level documentation that a TSI shall provide or update per Work Authorization includes, at a minimum, the documents listed in Table 2-45: Project-Level Documentation. For a full list of required documents, refer to Appendix 13, Project Deliverables Schedule.

Table 2-45: Project-Level Documentation

Document	Description
Project Scope	Provides information about the specific project, including any deliverables and their features, major project objectives, deliverables, and goals to help measure success.
Baseline Cost	Provides information about the amount of money the project is predicted to cost and when that money shall be used.
Project Schedule	Provides a simplified list of tasks with a timeline or project calendar, including major milestones and key deliverables. Refer to Section 2.7.1, Project Schedule for more information.
Updated Roles and Responsibilities (if required)	Provides information about the responsibilities of each role for the team for each Work Authorization and includes an Organizational Chart. Refer to Section 2.7.6.3, Staffing and Organizational Chart, for more information.

Document	Description
Project Risk Register	Identifies each risk and the mitigation strategies for each risk per project.
Communication Plan	This document provides information about how the TSI shall communicate information to stakeholders. This plan describes who should be given specific information, when that information should be delivered, and what communication channels shall be used to deliver the information.

2.7.3.2 Design and Development Demonstrations

CTRMA requires that the TSI provide systems/application demonstrations during the design and development phases of the project. These demonstrations will require the TSI staff to include system architects, designers, business analysts, and subject matter experts. The CTRMA staff and the CTRMA representatives will participate in these demonstrations. These demonstration sessions/meetings shall demonstrate to CTRMA the design and development of the system are ongoing, on track according to schedule, and shall meet the functional requirements of the system.

These demonstrations shall be identified in the master project schedule, and the timing and frequency of them shall be agreed upon between the TSI and CTRMA.

The TSI shall propose a weekly report format that, at a minimum, communicates the system component under design consideration, development, demonstrated, or tested during a period of the report (weekly and/or monthly). This report shall also communicate test cases exercised. This report shall be provided to CTRMA starting at the beginning of the design phase and shall be called out in the master project schedule. These reviews and demonstrations will all be conducted during the design, development, and even testing phase of the project, and all shall be concluded before the commencement of OAT.

Design and development reviews and demonstrations may be observed by CTRMA on-site at the TSI’s development location, via web-based demonstrations and conference calls, or at the CTRMA offices in Austin. The exact location of each development review and demonstration shall be determined and communicated to CTRMA no less than three (3) weeks before each review and demonstration. These sessions shall be conducted within the continental United States.

2.7.4 Report Development Workshops

The TSI shall facilitate report development workshops with CTRMA during the design phase using the following reports development methodology:

1. The TSI shall gather fundamental reporting requirements by answering these questions:
 - a. What is the purpose of the report?
 - b. How will the report be used?
 - c. Who will use the report?
 - d. Who are the secondary consumers of the report?

- e. Report frequency?
 - f. Report parameters and filters?
 - g. Data sources?
 - h. To which other reports shall this report tie?
 - i. Summary, detailed level, or both?
 - j. Basic layout?
2. The TSI shall provide a proof of concept/mock-up for approval by CTRMA, including a report data element dictionary, which shows the source or calculations for each data element, and an explanation of how the report should compare or match with other reports. The TSI shall gather feedback and requirements refinements and update the mock-ups.
 3. Final review with CTRMA for minor changes only.

In addition to the TSI's standard suite of reports, the TSI shall be responsible for designing, developing, testing, and implementing up to fifteen (15) custom reports. These custom reports shall be based on CTRMA's requirements. During the design phases of the project, if CTRMA is unable to provide the requirements for all fifteen custom reports, the TSI shall still be responsible for the design, development, testing, and implementation of all remaining custom reports.

Additionally, six (6) months after system acceptance, the TSI shall support significant updates to up to ten (10) existing standard reports. These report changes (for custom or standard reports) shall be provided to CTRMA at no additional cost.

2.7.5 Quality Assurance/Control Program

The TSI shall establish, maintain, and follow an effective Quality Assurance/Quality Control Program (QA/QC Program) to ensure adequate conformance to requirements and quality delivery of all project deliverables and tasks. This conformance to requirements includes the design, development, fabrication, processing, assembly, inspection, test, training, maintenance, packaging, shipping, storage, site preparation, and installation.

The QA/QC Program shall be overseen by a QA/QC Manager who reports at an organizational level above the TSI's Project Manager, or outside of the Project Manager's direct staff.

The TSI shall document the QA/QC program as part of a Quality Management Plan (QMP). The QMP shall describe the processes and procedures instituted by the TSI to ensure the QA/QC program functions as an integral part of the project.

All supplies, equipment, devices, hardware, software, and other services delivered as part of the contract, whether manufactured or performed within the TSI's plant or at any other source, shall be controlled at all points necessary to ensure conformance to the contract specifications. The QA/QC Program shall focus on the prevention, early detection, and correction of discrepancies.

TSI's QA/QC program shall provide control and tracking of purchased materials and subcontracted work. The TSI shall ensure the conformance of all supplies, components,

developmental tools, assemblies, subassemblies, and services procured from subcontractors and vendors to the requirements contained herein. The TSI shall also establish procedures for the selection of qualified, reputable, and financially secure suppliers and subcontractors and take responsibility for controlling the quality of the supplies and services provided.

The QA/QC Program shall include a process for logging and tracking system issues. This process shall include the initial recording of issues, follow-up tracking, and final disposition tracking during the design, development, testing, and implementation phases of the project. The QA/QC process shall ensure accurate problem or issue description and recording, assignment of personnel, tracking of progress for corrections/revisions, and regression testing, as applicable. The TSI shall use a fully integrated problem or issue tracking tool that includes reporting capability.

2.7.5.1 Change Control

The TSI shall propose an internal change control process as part of their QMP. Once approved by CTRMA, the change control process shall be instituted and utilized throughout the life of the project.

2.7.5.2 Configuration Management

The TSI shall use proven configuration management tools and techniques throughout the project to track and control versions of hardware, Commercial Off-The-Shelf (COTS) software products, and customized software. The TSI shall control their documentation through a configuration management system that tracks changes to documents and controls configuration release and version numbering. This plan shall include the methodology for keeping all products current and the planning and upgrade testing needed to accomplish this.

On an annual basis, the TSI shall ensure that all COTS software remains supported by its original manufacturer. The TSI shall also update system software and hardware to support any changes in third-party interface communications (through ICDs) and industry standards. If a COTS vendor announces the end of support for any installed COTS software products, the TSI shall make the necessary changes to support a replacement COTS product for at least the duration of the contract. If licensing requires renewal or action by CTRMA, the TSI shall make this request from CTRMA at least sixty (60) days before the expiration date of the license or product. If there are modifications to industry standards that warrant addressing to maintain required security, communication, safety, and performance, the TSI shall immediately notify CTRMA and shall propose an update or replacement equal or better to the current COTS product or custom software. This replacement plan shall include a schedule, proposed testing for approval before migration to the new product.

Once the TSI places any portion of the proposed system into operational service, the TSI shall not change or replace any production hardware or software without written approval from CTRMA. The TSI shall document any such approved changes as part of the configuration management process. The TSI shall provide and maintain specific change and release management plans reflecting the methodologies for the approval and release of any subsystem changes, including simple configuration changes or hard code changes.

The TSI shall obtain CTRMA's review and approval prior to any needed updates to the system(s) or communication network updates.

The Configuration Management Plan shall address the following areas:

1. Configuration Control:
 - a. Requirements management
 - b. Deviation and specification change requests
 - c. Data management
 - d. Configuration audits: functional and physical
 - e. Acceptance requirements for the installed ETCS
 - f. Testing requirements for the installed ETCS
2. Configuration Accounting:
 - a. Document Control and the Library Function
 - b. Accepted Documents
 - c. Revision History for Documents
 - d. Physical Item Content
 - e. Physical Item Where Used
 - f. Status of Changes
 - g. Changes by Product/Serial Number
 - h. Results of Configuration Audits
 - i. Configuration Management Accounting (As Designed, As-Built, As Delivered)
 - j. Revision Status of Installed ETCS
 - k. Version control

The Configuration Management Plan shall describe procedures to track and manage COTS and custom application software, hardware, configuration files, and project documentation following EIA-649-A 2004 National Consensus Standard for Configuration Management and 828-2012 IEEE Standard for Configuration Management in Systems and Software Engineering. The Configuration Management Plan shall include the manufacturer, version number, feature set, and the number of user licenses used of all COTS products, the methodology for keeping all products current, any testing required for an upgrade, and addressing implications and reconciliation of vendor support termination. CTRMA anticipates twenty (20) concurrent end-users of the system.

In addition to procedures to assure uniformity of installed software version and release for the project duration, the plan shall include the maintenance of an end of project checklist verifying all installed COTS and custom products are the current version and release. All COTS hardware shall provide information about the manufacturer, vendor contact information, model or part number, serial number, and feature set.

The TSI shall submit the Configuration Management Plan to CTRMA for review and approval.

The TSI's shall identify, categorize, code/label/name, track, and manage all project requirements, plans, design documentation, manuals, drawings, correspondence,

memorandums, subcontracts, and other documents under the TSI's control. The TSI shall document and track all revisions using a system of version control and change control logs.

All documentation developed by the TSI for the project, including materials developed to support training and marketing, shall be the property of CTRMA.

2.7.5.3 Continual Improvement Program

The TSI shall participate in a Continual Improvement Program (CIP) with CTRMA. The CIP intends to realize improvements in system and operations that shall benefit CTRMA and CTRMA customers. Benefits for CTRMA and CTRMA customers include the following, at a minimum:

1. Increasing revenue
2. Decreasing operating costs
3. Improving the customer experience
4. Improving data management, reporting, and audibility
5. Enhancing the efficiency and safety of the ETCS and the ETCS operations

Beginning with approval of the OAT, and annually after that, the TSI shall meet with CTRMA to identify elements of the ETCS and the TSI's operations to improve. The specific schedule for the CIP shall be determined after the contract award, but the TSI should assume that the first CIP meeting shall be held with CTRMA within one (1) year after system acceptance.

Within four (4) weeks of each meeting, the TSI shall provide CTRMA with a written proposal including the following elements:

1. A description of the element(s) of the ETCS and the TSI's operations identified for improvement. The description shall include how the TSI shall achieve the improvement(s), including all work necessary, changes to the ETCS, software, or equipment, and any required coordination or involvement from CTRMA.
2. A specific improvement goal(s), which indicates both the current performance level for the element(s) and the proposed improved performance level.
3. How the performance of the element(s) shall be tracked and measured. When applicable, improvements shall be driven by measurable performance characteristics. Results shall be measured to document performance improvements. All measured performance characteristics shall be based on objective criteria. The TSI shall clearly describe how CTRMA shall be able to review and validate the performance of the element(s).
4. A detailed description of benefits to CTRMA and CTRMA customers that would result from the improvement(s). If possible, the description of benefits shall include a financial analysis of how the proposed improvement(s) would result in the following:
 - a. Higher revenue
 - b. Lower operating costs
 - c. Improved customer service
 - d. Data management
 - e. Reporting

- f. Audibility
 - g. Enhancement of the efficiency and safety of the ETCS and the ETCS operations
5. A detailed precedent oriented schedule presenting the activities required to realize the proposed improvement, including the time frame over which the improvement shall be measured and the date by which the improvement goal shall be reached.
 6. A description of how the TSI shall maintain the improved element(s) at a higher performance level.
 7. A detailed cost estimate to implement the improvement. The cost shall include the TSI's labor, materials, and other costs.

CTRMA shall have four (4) weeks to review the TSI's Proposal and approve, reject, or ask for modifications. If CTRMA requests modifications, the TSI shall provide a revised Proposal to the TSI within four (4) weeks. CTRMA may choose not to implement an improvement at any time before accepting a Proposal and instructing the TSI to proceed with an improvement(s). CTRMA may postpone CIP meetings or suspend the CIP program at any time at its sole discretion.

2.7.6 Program Management

The following sections provide information regarding the TSI's approach to program management.

2.7.6.1 Project Methodology

The TSI shall demonstrate a thorough understanding of the project phases and key knowledge areas for project management identified by the PMI. The PMP shall explain how the TSI use of PMI techniques will lead to successful project implementation. The PMP shall address how the TSI shall manage the following elements:

1. Project communication
2. Primary project responsibility
3. A risk register that identifies all risks and details how the risks shall be managed and mitigated
4. Subcontractor management and coordination
5. Progress scheduling (Critical Path Method [CPM] based)
6. Progress reporting and coordination with CTRMA
7. Testing
8. Design and development reviews
9. On-site installation
10. Record keeping, including generating all meeting agendas and minutes

Refer to Section 2.7.3.1.1, Program Management Plan , for information regarding the PMP.

2.7.6.2 Responsibilities Matrix

The Responsibilities Matrix shall document the roles and responsibilities of all parties involved with the design, construction, installation, testing, commissioning, and maintenance of the ETCS being procured under this RFP. Approval of the Responsibility Matrix by CTRMA is a

precondition to payment of the mobilization milestone, and it is acceptable for the TSI to submit this matrix before the PMP if desired.

The primary parties involved with this project include, but are not limited to, CTRMA and the TSI and its subcontractors and vendors. The TSI shall identify and include all other primary parties involved with its work.

All work shall be broken down to element, task, and component within the subsystems, with responsibility assigned to one of the parties as taking a lead role. Any support and/or coordination activities shall also be identified and assigned.

2.7.6.3 Staffing and Organizational Chart

The TSI shall include an organization chart and resumes per Appendix 5, Technical Response Guide, listing the key project personnel along with their roles and responsibilities, and the percentage of time they shall dedicate to the project.

Table 2-46 provides information about the TSI’s key personnel for the project.

Table 2-46: TSI’s Key Personnel for Project

Key Position	Description
Principal-In-Charge	<p>The Principal-In-Charge should have been an employee of the TSI for a consecutive six (6) months. This position shall have a minimum of ten (10) years of experience in the toll/revenue collection industry, with at least the last five (5) years shall have included senior management responsibility for major projects of which at least one (1) project shall have been five (5) million dollars or more in value.</p> <p>The Principal-In-Charge is responsible for the performance of the Program Manager and a point of contact for any escalated project issues that cannot be resolved by the Program Manager.</p>
Program Manager	<p>The Program Manager shall have been an employee of the TSI for a consecutive six (6) months and shall have a minimum of ten (10) years of experience in the toll/revenue collection industry, of which at least the last five (5) years shall have included senior management responsibility for major projects of which at least one (1) project shall have been five (5) million dollars or more in value. Certification as a Project Management Professional by the Project Management Institute is preferred, but not required.</p> <p>The Program Manager is responsible for the overall conduct and performance of the project, oversight of the project and is primarily responsible for the day-to-day execution of the work. The Program Manager is responsible for the execution of the work, acts as an agent, a single point of contact in all matters on behalf of the TSI, and must be present (or an approved designee shall be present) at the project site at all times when the work is being performed. The Program Manager must be available to execute instructions and directions received from CTRMA or its authorized representatives.</p>

Key Position	Description
	<p>The Program Manager shall be a locally dedicated resource.</p>
Deputy Program Manager	<p>The Deputy Program Manager serves as a backup to the Program Manager and must support the Program Manager in the day-to-day execution of their duties and delivery of the work.</p> <p>This backup position can be provided by existing key personnel (e.g., the Maintenance Manager could also serve as the Deputy Program Manager). However, the Deputy Program Manager role is the only key personnel position that can be held by the same individual as another key personnel position. Note: The Program Manager cannot also serve dual roles as the Deputy Program Manager.</p>
Installation Manager	<p>The Installation Manager shall have a minimum of five (5) years of experience, within the last seven (7) years, managing the construction coordination and field installation of toll systems, for both traditional toll roads and dynamically priced managed lanes of at least the size and scope of this contract.</p> <p>The Installation Manager is responsible for the installation of the entire toll system at the project site from planning to acceptance, and always following all relevant safety guidelines during the installation. This responsibility includes design and construction coordination before the project site becomes available and throughout the installation.</p>
Maintenance Manager	<p>The Maintenance Manager shall have a minimum of five (5) years of experience within the last seven (7) years, maintaining toll systems for AET (including dynamically priced managed lanes) of at least the size and scope of this contract.</p> <p>The Maintenance Manager is responsible for the ongoing maintenance of the system to meet functional and performance requirements.</p> <p>The Maintenance Manager shall be a locally dedicated resource.</p>

Key Position	Description
Quality Manager	<p>The Quality Manager shall have a minimum of five (5) years of experience within the last seven (7) years, implementing best practices for quality control and quality assurance.</p> <p>The Quality Manager must provide quality oversight on all aspects of the work and all deliverables to CTRMA, to ensure compliance with the Quality Management Plan (QMP). The Quality Manager must also provide the following, at a minimum:</p> <ol style="list-style-type: none"> 1. Provide oversight of the quality of the work and detailed review process for the system design 2. Not be involved with direct scheduling or production activities 3. Report directly to the TSI’s management team 4. Ensure the TSI’s design staff follows the implementation of the methods and procedures contained in the approved QMP 5. Provide document control verification report and coordinate all issues directly with the TSI’s Program Manager and CTRMA’s designated representative

The TSI shall provide detailed resumes for each key personnel resource. The TSI shall submit any changes to these key personnel to CTRMA in writing for approval for the duration of the contract. CTRMA shall require the TSI to promptly replace the said individual with a person suitably qualified, within thirty (30) days of the event requiring replacement and acceptable to CTRMA. Additionally, the TSI shall perform background checks of all key staff.

The TSI shall clearly describe categories of work performed by the TSI’s personnel and those categories that shall be performed by subcontractors, who shall be named in the Proposal and included in the Organizational Chart. The TSI PMP shall include a description of the procedures used for managing all subcontractors, specifically how the TSI shall address communications and how to escalate any issues that may arise. Any TSI modifications from the Proposal that includes key personnel or responsibilities to be shifted from TSI to a subcontractor and vice versa shall be requested in writing for approval by CTRMA. The TSI shall communicate the details of these key personnel changes or responsibilities through updates to the project schedule and the PMP, specifically the Organizational Chart, the Roles and Responsibilities, and a resume of the new key personnel.

The TSI shall submit these updates to CTRMA for approval no fewer than sixty (60) days of the actual transition of responsibilities.

Before the implementation of the change in responsibilities, CTRMA shall provide approval in writing upon acceptance of the staff changes portions of the PMP.

2.7.6.4 TSI Personnel Security

All TSI personnel shall be subject to security and background checks to the satisfaction of CTRMA. The TSI shall obtain written approval from CTRMA for all service personnel.

The TSI’s personnel shall be issued CTRMA identification badges and shall always wear such identification badges when performing duties on the project. The CTRMA identification badges

cannot be shared among different TSI personnel. The TSI personnel shall only use the CTRMA identification badges they are assigned.

Misuse of the CTRMA identification badges (e.g., using one badge for multiple TSI personnel, or using the identification badges for purposes other than work associated with the project) may result in termination of the employee from the project and possibly other legal or disciplinary action.

The TSI shall not use the CTRMA facilities as a co-location for its staff and their vehicles. However, TIM Center operators are the exception.

2.7.6.5 Online Document Sharing and Document Management System

The TSI shall use a secure, online project management/collaboration software of their choice to internally manage, share, and distribute project documents and information (e.g., SharePoint, Dropbox, Sync.com), including copies of all submitted versions of plans and documentation. CTRMA will also provide a document management system for the TSI to submit all documentation and deliverables into that system. Any documentation that is stored in the TSI document management system shall also be copied to the CTRMA document management system.

The TSI shall provide and maintain for the duration of the contract, a secure document management system. This document management system shall identify, categorize, track and manage all project plans, manuals, business rules, and requirements, design documentation, test cases, training materials, as-built documentation, and other project documents defined under Appendix 13, Project Deliverables Schedule. All documentation and artifacts contained in the document management system shall be easily searchable and accessible by authorized users of both CTRMA (and others designated by CTRMA) and the TSI. The TSI shall provide the required licensing of the product for each user accessing the system. Updated versions of project documents shall be submitted to CTRMA for approval whenever significant revisions are made to project documentation. All documentation developed by the TSI for the project, including materials developed to support training and marketing, shall be the property of CTRMA.

The TSI shall provide a Documentation Lead for the duration of the contract to ensure all documentation revisions are documented and tracked using a system of version control and change control logs. The Documentation Lead shall also ensure all documentation is successfully updated when changes in requirements, change orders, Work Authorizations, or upgrades or changes in software or equipment occur. The Documentation Lead shall ensure all documentation, particularly those related to design (e.g., ICDs, RTM, SDDD), training, user manuals, or procedural items (e.g., maintenance and disaster recovery), is maintained and remains current, incorporating any system changes or new projects coming online, for the duration of the contract. The TSI shall provide training to the CTRMA staff for accessing documents in the document management system, if necessary.

All documentation shall be submitted to CTRMA for review, comment, and approval. CTRMA may require updated versions of draft documentation before providing approval. Draft and

final versions of documentation shall be delivered electronically to CTRMA using online document sharing. The TSI shall deliver documents in a standard Microsoft Office application format, which allows for red-lining and tracking changes. All documents are subject to version control; once submitted to CTRMA, the TSI shall submit all future revisions of a document in both red-lined and clean versions.

2.7.6.6 Records Keeping

The TSI shall maintain quality records and data such as records of design reviews and code walkthroughs, inspections and test results, records pertaining to nonconforming material, change order documentation, audit results, and all other records related to the RFP and resulting contract for no less than five (5) years after the expiration of the contract. This information shall be made available to CTRMA at any time upon request.

2.7.7 Risk Management

The PMP shall describe the risk management method the TSI shall implement to identify, track, and mitigate areas of project risk, including cost. The TSI shall track concerns throughout the project, such as the occurrence of certain events with assigned and described risk probability, impact, and mitigation (e.g., elimination, contingency, and reduction). Special risk planning sessions shall be initiated by the TSI at least five (5) months before go-live activities are planned for the TFH and each facility, as they are transitioned. These risk planning sessions shall include the following deliverables:

1. Identify all high-risk events which could occur as part of the deployment in terms of transitioning co-located equipment and devices and transaction processing, and historical data retrieval and reporting.
2. Produce queries that seek to identify any occurrence of the high-risk items identified in the item.
3. At pre-defined intervals, review reports and queries for validity, and notify the responsible TSI resources for immediate issue assessment if the results are invalid. The CTRMA-assigned distribution list shall receive status reports of the results generated and sent daily, during a defined time (e.g., four [4] weeks) immediately after go-live.

2.7.9 Cooperation with Others

CTRMA shall be entitled to full and prompt cooperation of the TSI in all aspects of the work. The TSI shall use best efforts to minimize any disruption to CTRMA's regular business operations (including am and pm peak hours as applicable) when the TSI is performing services. Close coordination between the TSI, the CTRMA operations staff, and other contractors shall exist during all phases of the project. The TSI shall work closely with any other contractors working for CTRMA in coordinating any activity which may affect both the contractors and CTRMA. This coordination especially pertains to CTRMA's DPS connectivity and integration testing, contractors performing equipment installation, equipment testing, power requirements, conduit requirements, and researching networking issues, which may involve multiple contractors.

The TSI shall also cooperate with other parties, including vendors, governmental agencies, and other maintenance providers, as required, to ensure that maintenance functions are handled effectively, efficiently, and per all specifications of any applicable vendors, governmental agencies, and other maintenance providers.

The TSI shall respond to the CTRMA requests for information within two (2) business days unless otherwise agreed to by CTRMA.

2.8 INSTALLATION OF NEW FACILITIES

The TSI shall be responsible for the installation of the TSI's ETCS for new facilities as they are constructed and made ready for toll equipment installation and ETCS testing and operations. The TSI shall be required to coordinate efforts and schedules and shall provide CTRMA with an Installation Plan for all new facilities.

The TSI shall begin installation work upon approval of individual Work Authorizations for each facility, as described in Section 2.2.1, Work Authorization and Project Delivery.

General information for the planned facilities is found in Section 2.3, Existing Equipment, Infrastructure, Buildings, and Communication. Additional information may be found on each project's website:

1. 183 North: <http://www.290Tollorth.com/>
2. MoPac South: <http://www.mopacsouth.com/>
3. 183A Phase III: <https://183a.com/>

Note: Project schedules and plans for all planned facilities continue to be developed and are subject to change.

The TSI shall install all proposed hardware, equipment, software, and devices required to implement, integrate, and maintain an ETCS that meets all the requirements described herein. To install the roadside systems, the TSI shall supply all required installation personnel, tools, materials, equipment, and traffic control devices.

The TSI shall install all components manufactured/provided by any third parties per the manufacturer's installation instructions. The TSI shall arrange on-site and remote support services, as needed, from a third-party vendor for proper installation and operation of equipment at no additional cost to CTRMA.

The TSI shall procure and install any additional infrastructure required to operate and maintain the ETCS. This additional infrastructure may include, but is not limited to, additional electrical and communication conduit, ducting, pull boxes, junction boxes, wires, cables, connectors, terminals, and termination labels. The TSI shall coordinate with CTRMA to provision the required network equipment, bandwidth, and connectivity to the newly established toll facilities in support of the ETCS.

The TSI shall install and configure the proposed ETCS software and any supporting software (e.g., operating system, networking, database, monitoring) on all proposed computers, workstations, and servers. The TSI shall coordinate all work with the CTRMA operations staff.

The TSI and CTRMA shall then determine if the work needs to occur after hours or on the weekends to minimize impacts on existing operations. All TSI-provided systems shall provide compatibility to run on the CTRMA-provided workstations, and the CTRMA designated representative-provided workstations.

2.8.1 Installation Plan

The TSI shall submit an Installation Plan to CTRMA for review, comment, and approval before the start of any installation activities. The Installation Plan shall provide a comprehensive description of all aspects of the installation activities associated with the project, including the following:

1. Installation approach, including timing for the installation and integration of all systems,
2. Installation readiness assessment, including a risk matrix that identifies risks, assesses the probability of those risks occurring, and proposes mitigation or elimination strategies. Reasonable scenarios of problems should be presented, and proposed actions are taken to allow installation to continue.
3. Facilities operations.
4. Toll Facility Host integration, which includes image processing, trip building and dynamic pricing functionality (if applicable), report validation, DPS integration, TSI QA/QC processes and procedures, and support for any auditing process.
5. Predecessor and successors of all activities.

The TSI shall provide an initial Bill of Materials (BOM) for all hardware, COTS software, and equipment both supplied and reused under this contract, including spare inventory with the Installation Plan. All COTS hardware manufacturer, vendor contact, model or part number, and feature set information shall be described. The System Detailed Design Document (SDDD) submittal shall include the final BOM. CTRMA shall review and approve both the initial and final BOM.

Table 2-47 provides additional information about the tasks the TSI shall address within the Installation Plan.

Table 2-47: Tasks and Activities Addressed in the Installation Plan

Task	Description
Install Tasks and Activities	Includes all activities and deliverables for the installation of the zone controllers and all roadside devices, including integration to the TFH. These activities include general communications, coordination with CTRMA’s communications office, coordination with the existing maintenance TSI and other contractors of CTRMA, being aware of the current operating condition of all affected subsystems just before scheduled installation, and completion of subsystem training mainly related to handling maintenance alerts/alarms.
Pre-deployment Tasks	Includes tasks and deliverables required for a clean and successful installation and go-live, but that may precede the actual deployment by a few days or weeks. These tasks are where checklists are reviewed, resources are re-confirmed, advance notices of outages are communicated,

Task	Description
	and where agreements on formal roles and responsibilities are documented.
Deployment Tasks	These are the actual go-live tasks that are performed for the implementation, usually starting 24 to 48 hours before go-live. The Work Breakdown Structure (WBS) for the installation task shall include the activities of the involved parties.
Post Deployment Tasks	<p>These are all the quality monitoring and production verification tasks post-go-live to ensure all systems are operating efficiently and as expected, and data is accurately mapped to the TFH. The incident management procedures for go-live shall be included in this section of the plan. These procedures shall include a daily report of all open incidents/tickets since go-live, their status and next steps to resolve, escalation procedures, and how CTRMA and its consultants shall have access and monitoring capabilities during post-deployment.</p> <p>The TSI shall propose a post-implementation support period for up to a maximum of four (4) weeks. This post-deployment period shall include additional TSI resources to monitor the system 24/7, report and communicate degradation in addition to MOMS incidents, and resolve problems. If there are still critical system deficiencies after four (4) weeks, CTRMA may extend this period until all critical items are resolved.</p>

All pre-deployment, deployment, and post-deployment tasks for the Installation Plan schedule shall include at a minimum:

- SECTION 1 – WBS number
- SECTION 2 – WBS name
- SECTION 3 – Resources performing the task activity
- SECTION 4 – Subsystem affected
- SECTION 5 – Task duration (includes start to finish of activities to complete the task)
- SECTION 6 – Planned versus actual time at the start of the task

2.8.2 Installation Meetings

The TSI shall schedule and attend weekly installation meetings during the installation phase of all projects. The TSI and all subcontractors shall ensure that appropriate personnel are present at these meetings. The TSI shall ensure the personnel is authorized to make decisions on behalf of the TSI. Appropriate updates shall be made to the Master Project Schedule, issue lists, status updates, and planned activities. The TSI shall prepare and distribute a meeting agenda at least 24 hours before each installation meeting. This agenda shall consist of those items pertaining to the installation schedule and activities for the previous and current week’s installation efforts. All issues recorded during installation activity for the week shall be discussed and resolved if possible. An open action items list shall also be maintained for any outstanding work items related to the installation meeting(s).

2.8.3 Installation Checklist

The TSI shall develop and submit to CTRMA to review an installation checklist for all TSI installation activities. The checklist shall detail all items required for the installation team to complete the installation process. A copy of the completed checklist shall be provided to CTRMA after the completion of all installation activities. The TSI shall ensure the arrival of hardware on-site (or staged locally) thirty (30) days before the installation. The TSI shall also perform all hardware verifications before the start of the installation. The installation checklist shall include the following, at a minimum:

1. Equipment/Device Description
2. Manufacturer
3. Model Number
4. Serial Number Release (for firmware if required)
5. Operating System (for comparison with design documentation and product-specific cut sheets)

2.8.4 Installation Work Restrictions

Daytime work will generally be allowed but must always be planned and approved by CTRMA. The TSI shall coordinate with CTRMA and cooperate with other civil, electrical, or construction contractors as directed by CTRMA.

2.9 TRANSITION OF EXISTING FACILITIES

The TSI shall be responsible for transitioning from the existing legacy ETCS to the new ETCS. The TSI shall coordinate efforts and schedules with CTRMA's legacy ETCS contractor, their DPS provider, CUSIOP Hub, and the CTRMA's Pay by Mail (PBM) Violations Processing, Collections, and Customer Services contractor, as needed. The TSI shall provide a Transition Plan for each of the CTRMA facilities. This Transition Plan shall describe the methodology, process, and testing required to transition/cutover from the legacy ETCS to the new ETCS.

The transitioning and systems cutover shall ensure that operations are continuously maintained during the cutover process. Interruptions to the processing of tolls, data transmittal and storage, system reporting, system access, toll facility use, and auditing during the cutover period shall be minimized to the greatest extent possible. Any interruptions shall be thoroughly planned and documented in the TSI's transition plan and subject to approval by CTRMA.

The TSI shall begin transition work upon approval of the Work Authorization(s) as described in Section 2.2.1, Work Authorization and Project Delivery. Work Authorization approval is required for the initiation of Phase I, which includes implementation of the TFH and transition of the first facility ETCS. Each additional facility transition, as described in Phase II, shall commence upon successful completion of previous Work Authorizations and approval of each subsequent individual Work Authorizations specific to each facility. Phase III includes the final transition Work Authorization and transition of the last facility and a complete OAT for all previously implemented equipment, software, and systems. The order of the transition of each facility is

projected based on the current End-of-Life (EOL) dates for the currently installed equipment. The TSI may propose alternatives to the transition approached described herein for consideration by CTRMA.

2.9.1 Transition Plan and Full System Transition

The Transition Plan shall describe the TSI's approach to either use as is, upgrade, and/or replace all or some roadside tolling systems. It is assumed for this project that the new ETCS and CTRMA's ITS infrastructure will share space and reside within the same enclosures at certain plazas at the beginning of this contract. The transition plan for each facility shall be tailored for each Work Authorization to address any unique requirements, equipment, or transition considerations specific to each facility.

The TSI shall submit a Transition Plan to CTRMA for review, comment, and approval before the start of any transition activities. The Transition Plan shall provide a comprehensive description of all aspects of the transition activities associated with the project, including the following:

1. Transition approach, including the timing for the transition of system elements and facilities.
2. Information about the transition team.
3. Network cutover and maintenance.
4. Transition readiness assessment, including a risk matrix that identifies transition risks and proposes mitigation or elimination strategies. Reasonable scenarios of transition problems shall be presented and proposed actions to allow the transition to continue.
5. Facility operation during the transitions.
6. Toll Facility Host integration and operation to include image processing, trip building, dynamic pricing, TSI QA/QC, and support for the CTRMA auditing process.
7. Rollback approach, where the TSI shall provide information on how they ensure database integrity with rollback operations.
8. Predecessors and successors for all activities, including entry and exit criteria.

The TSI shall provide an initial Bill of Materials (BOM) for all hardware, COTS software, and equipment both supplied and reused under this contract, including spare inventory with the Transition Plan. All COTS hardware manufacturers, vendor contact, model or part number, and feature set information shall be described. The System Detailed Design Document (SDDD) submittal shall include the final BOM. CTRMA shall review and approve both the initial and final BOM.

The TSI shall provide an installation verification/checklist document to CTRMA for use in verifying that all transitioned systems (hardware) match appropriate design documentation. This checklist shall include the following, at a minimum:

1. Equipment/Device Description
2. Manufacturer
3. Model Number
4. Serial Number Release (for firmware if required)

5. Operating system (for comparison with design documentation and product-specific cut sheets)

Table 2-48 provides additional information about the tasks the TSI shall address within the Transition Plan.

Table 2-48: Tasks and Activities Addressed in the Transition Plan

Task	Description
Transition Tasks and Activities	Includes all activities and deliverables for the installation of the zone controllers and all roadside devices, including integration to the TFH. These activities include general communications, coordination with CTRMA’s communications office, coordination with the existing maintenance TSI and the other CTRMA contractors, being aware of the current operating condition of all affected subsystems just before scheduled transition, and completion of subsystem training mainly related to handling maintenance alerts/alarms.
Pre-deployment Tasks	Includes tasks and deliverables required for a clean and successful cut-over and go-live, but that may precede the actual deployment by a few days or weeks. These tasks are where checklists are reviewed, resources are re-confirmed, advance notices of outages are communicated, and where agreements on formal roles and responsibilities are documented.
Deployment Tasks	These are the actual go-live tasks that are performed for the implementation, usually starting 24 to 48 hours before go-live. The Work Breakdown Structure (WBS) for the transition task shall include the activities of the involved parties.
Post Deployment Tasks	<p>These are all the quality monitoring and production verification tasks post-go-live to ensure all systems are operating efficiently and as expected, and data is accurately mapped to the proposed TFH. The incident management procedures for go-live shall be included in this section of the plan. These procedures shall include a daily report of all open incidents/tickets since go-live, their status and next steps to resolve, escalation procedures, and how CTRMA and its consultants shall have access and monitoring capabilities during post-deployment.</p> <p>The TSI shall propose a post-implementation support period for up to a maximum of four (4) weeks. This post-deployment period shall include additional TSI resources to monitor the system 24/7, report and communicate degradation in addition to MOMS incidents, and resolve problems. If there are still critical system deficiencies after four (4) weeks, CTRMA may extend this period until all critical items are resolved.</p>

All pre-deployment, deployment, and post-deployment tasks for the Transition Plan schedule shall include at a minimum:

1. WBS number
2. WBS name
3. Resources performing the task activity
4. Subsystem affected

5. Task duration (includes start to finish of activities to complete the task)
6. Planned versus actual time at the start of the task

2.9.2 Transition Meetings

The TSI shall schedule and attend weekly transition meetings during the transition of each facility. The TSI and any subcontractors shall ensure that appropriate personnel are present at these meetings. The personnel shall be authorized to make decisions on behalf of the TSI. Appropriate updates shall be made to the Master Project Schedule, issue lists, status updates, and planned activities. The TSI shall prepare and distribute a meeting agenda at least 24 hours before the scheduled meeting. This meeting agenda shall consist of those items pertaining to the transition and schedule for the previous and current week's transition efforts. All issues recorded during the transition activity for the week shall be discussed and resolved if possible. An open action items list shall also be maintained for any outstanding work items related to the transition meetings.

2.9.3 Transition Checklist

The TSI shall develop and submit to CTRMA to review a transition checklist for all TSI transition activities associated with the system. The checklist shall detail all items required for the transition team to complete the transition process. A copy of the completed checklist shall be provided to CTRMA after the completion of the transition activity. The TSI shall ensure the arrival of hardware on-site thirty (30) days before the transition. The TSI shall also perform all hardware verifications before the start of the transition.

2.9.4 Transition Work Restrictions

Daytime work will generally be allowed but must always be planned and approved by CTRMA. The TSI shall coordinate with CTRMA and cooperate with other civil, electrical, or construction contractors as directed by CTRMA.

2.9.5 Reuse of Equipment

The TSI has the option to re-use roadside tolling equipment/devices, along with all existing infrastructure, conduits, cabinets, hub buildings, and electrical and communications equipment and cabling. For any/all re-used equipment, the TSI's delivered system shall conform to the contractual functional and performance requirements for the term of the contract. CTRMA does not assert the condition, functionality, or performance of any currently installed equipment.

If the TSI determines the existing infrastructure requires modification to support the installation of the new ETCS, the TSI shall submit installation drawings detailing installation requirements for CTRMA's review, approval, and professional engineering stamp. The TSI shall maintain all documentation regarding the equipment installation and make it accessible to CTRMA or their representatives upon request.

The TSI shall determine the condition and fitness for the reuse of any currently installed equipment during the site surveys before the submittal of the TSI's Proposals. The TSI will

have additional opportunities to determine the condition and fitness for the reuse of currently installed equipment before each Work Authorization.

Refer to Section 2.3.2, Existing Deficiencies, for additional information on this certification, and Appendix 16, Existing Conditions Report, for information on the existing CTRMA equipment.

The TSI shall provide all other equipment under this Scope of Work to meet the requirements detailed herein and all applicable SLAs, as described in Appendix 7, Service Level Agreement. Additionally, following the appropriate CTRMA-approved equipment disposal procedures, the TSI shall de-install, remove from the premises, and properly dispose of any existing equipment not reused.

If cabinets are full of ITS devices, in addition to the ETCS hardware, the TSI's approach may involve a new cabinet be attached to the existing enclosure, or a new cabinet mounted next to the existing cabinets to create a pass-through via conduits. The new enclosures would provide space for the ETCS equipment, while the old cabinet remains in place for the ITS. If CTRMA relocates the ITS hardware, these conduits could be removed, and a watertight cover placed over the holes to return the cabinet(s) to a National Electrical Manufacturer Association (NEMA)-4 rating.

The transition approach contains distinct phases and scheduling requirements for the transition of each existing facility and implementation of the new ETCS as it replaces elements of the Legacy ETCS. The transition approach requires concurrent activities from the TSI and integration with CTRMA's DPS, which ultimately serves as CTRMA's central transaction processor and gateway to the CUSIOP Hub and CTRMA's PBM back office. CTRMA has defined a transition approach described in the following sections. TSI's may propose an alternate transition approach for CTRMA's consideration. Any proposed transition approach must adequately address cost, risk, schedules, continuity of service, and operational efficiency during and after the period of transition.

2.9.6 Transition Phases

The transition approach is divided into three overall phases, generally delineated by the successful completion of major milestones in the preceding phase. Checklists for Phases I, II, and III can be found in Table 2-49. These dates are subject to change pending approval of the Master Project Schedule.

Table 2-49: Transition Phases/Completion Milestones

2.9.6.1 Phase I Transition

This phase includes the design, development, fabrication, and testing of all software and components of the ETCS, including the successful performance of a TFH Factory Acceptance Test (FAT) and Roadside FAT. The TSI shall perform each FAT with the participation of CTRMA and CTRMA's representatives. The transition from the Legacy ETCS to the new ETCS will require several steps. These steps are defined in Table 2-50 and depicted in Figure 2-20 through Figure 2-24.

Steps 1 - 3 are not the responsibility or within the scope of the new TSI's work but are prerequisites for the Phase I transition to begin.

Table 2-50: Phase I Transition Steps

Step	Phase I Activities	Reference Figure
Step 1 (CTRMA)	Implementation of CTRMA's DPH: <ol style="list-style-type: none"> 1. CTRMA develops and implements the CTRMA DPH. 2. CTRMA's DPH is fully functional and ready to begin integration testing. 	Figure 2-20
Step 2 (CTRMA)	Integration of CTRMA's DPH to the CUSIOP Hub and CTRMA's Pay By Mail back office system: <ol style="list-style-type: none"> 1. CTRMA completes certification testing with CUSIOP. 2. CTRMA completes testing with CTRMA's Pay By Mail back office system contractor. 	Figure 2-21
Step 3 (CTRMA)	Transition of Partner RMA interfaces from Legacy TSI Host to the CTRMA DPH: <ol style="list-style-type: none"> 1. For CTRMA to decommission the Legacy TSI Host, NET RMA and CCRMA must transition to the DPH. 2. The DPH will now serve as a gateway for partner RMAs to exchange data with the CTRMA PBM BOS and the CUSIOP Hub. 3. CCRMA operates its own BOS independently of CTRMA/NET RMA. 	Figure 2-22
Step 4 (TSI)	The New TSI designs, develops, tests, and integrates the new TFH to CTRMA's DPH: <ol style="list-style-type: none"> 1. The new TSI will implement and test the new TFH to ensure the TFH can communicate with the DPH and is ready to accept transactions from CTRMA's existing roadside facilities. 2. All reporting, auditing, and reconciliation continue through the Legacy ETCS. 3. The new TFH is to be ready to process VES images, transactions, transmit all required data to the DPH, and generate all required reports. 4. The new TFH is thoroughly tested, and all functionality is validated, including: <ol style="list-style-type: none"> a. AVI and video transaction processing b. Trip building c. Dynamic pricing d. Lane monitoring and control e. Reporting f. MOMS g. Equipment monitoring h. DPH integration testing completed 	Figure 2-23
Step 5 (TSI)	The TSI begins the transition of the first facility from the Legacy ETCS to the new ETCS and the new TFH:	Figure 2-24

Step	Phase I Activities	Reference Figure
	<ol style="list-style-type: none"> 1. The new TSI prepares for equipment installation, testing, and cutover of the first roadside facility from the Legacy ETCS to the new TSI ETCS. 2. Roadside FAT testing has begun. 3. Roadside FAT data has been compiled, reviewed, and approved by CTRMA. 4. The transition of all in lane hardware at 290 Toll is complete. 5. All legacy hardware is appropriately disposed of according to the CTRMA policy. 6. New toll lanes transactions at 290 Toll are flowing directly to the new TFH. 7. Toll transactions for the transitioned facility are now processing through CTRMA’s DPH and submitted to the CUSIOP Hub and CTRMA’s Pay By Mail BOS for further processing. 8. The network is transitioned over to the new TSI for transitioned facilities. 9. Site Commissioning is complete at 290 Toll. 10. Legacy system components are disposed of per the CTRMA requirements. 	

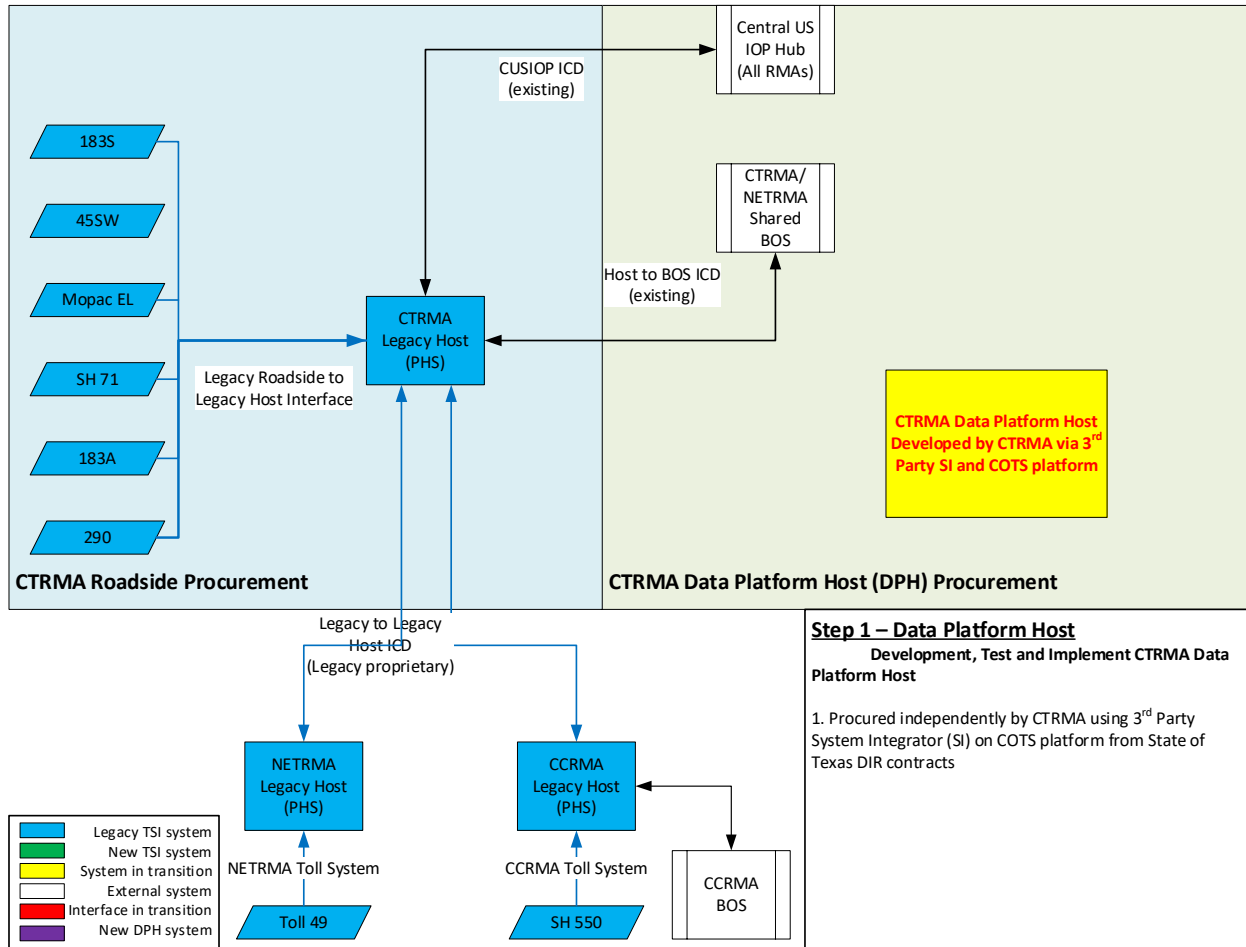


Figure 2-20: Step 1 - Implementation of CTRMA's Data Platform Host

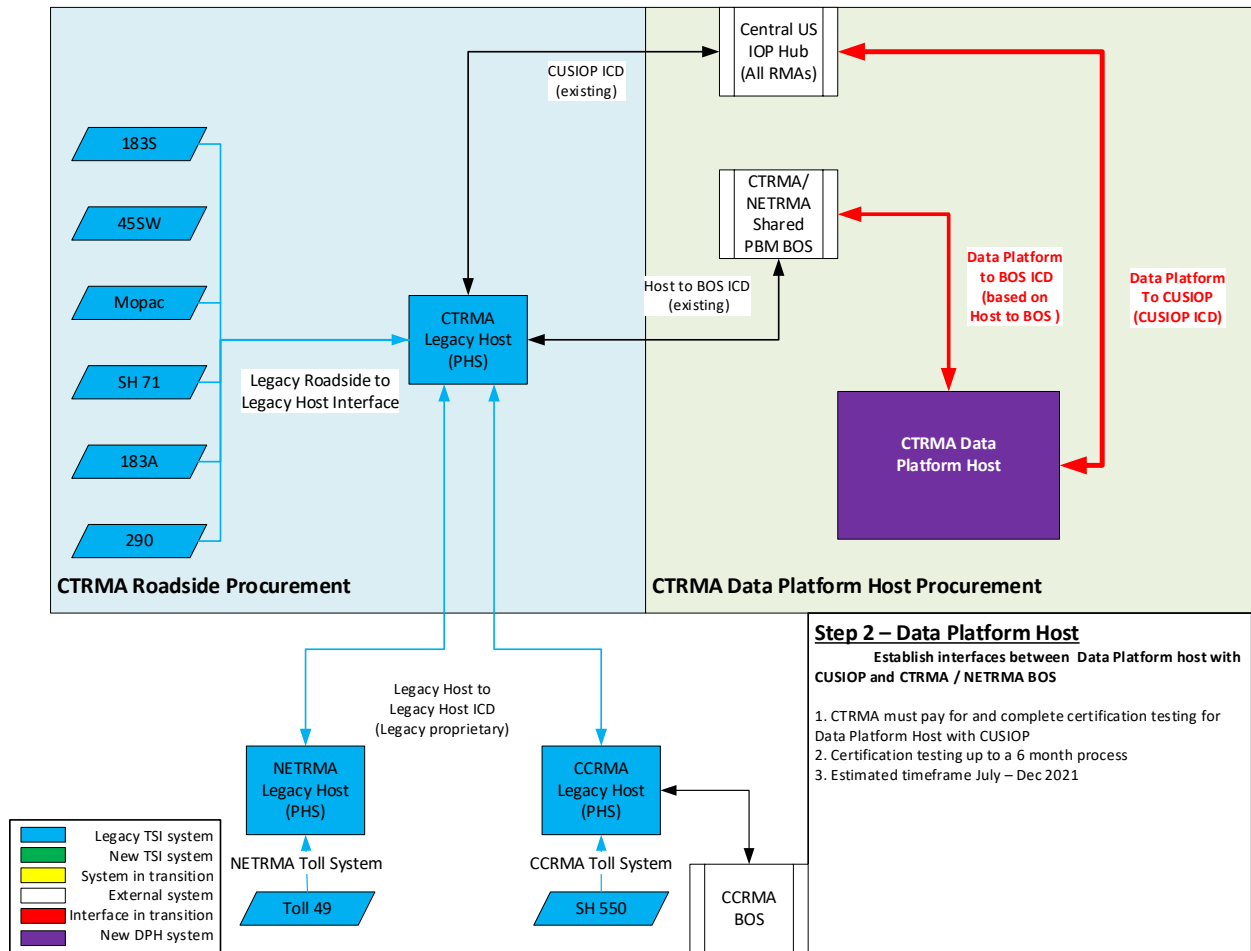


Figure 2-21: Step 2 - Integration of CTRMA's Data Platform Host

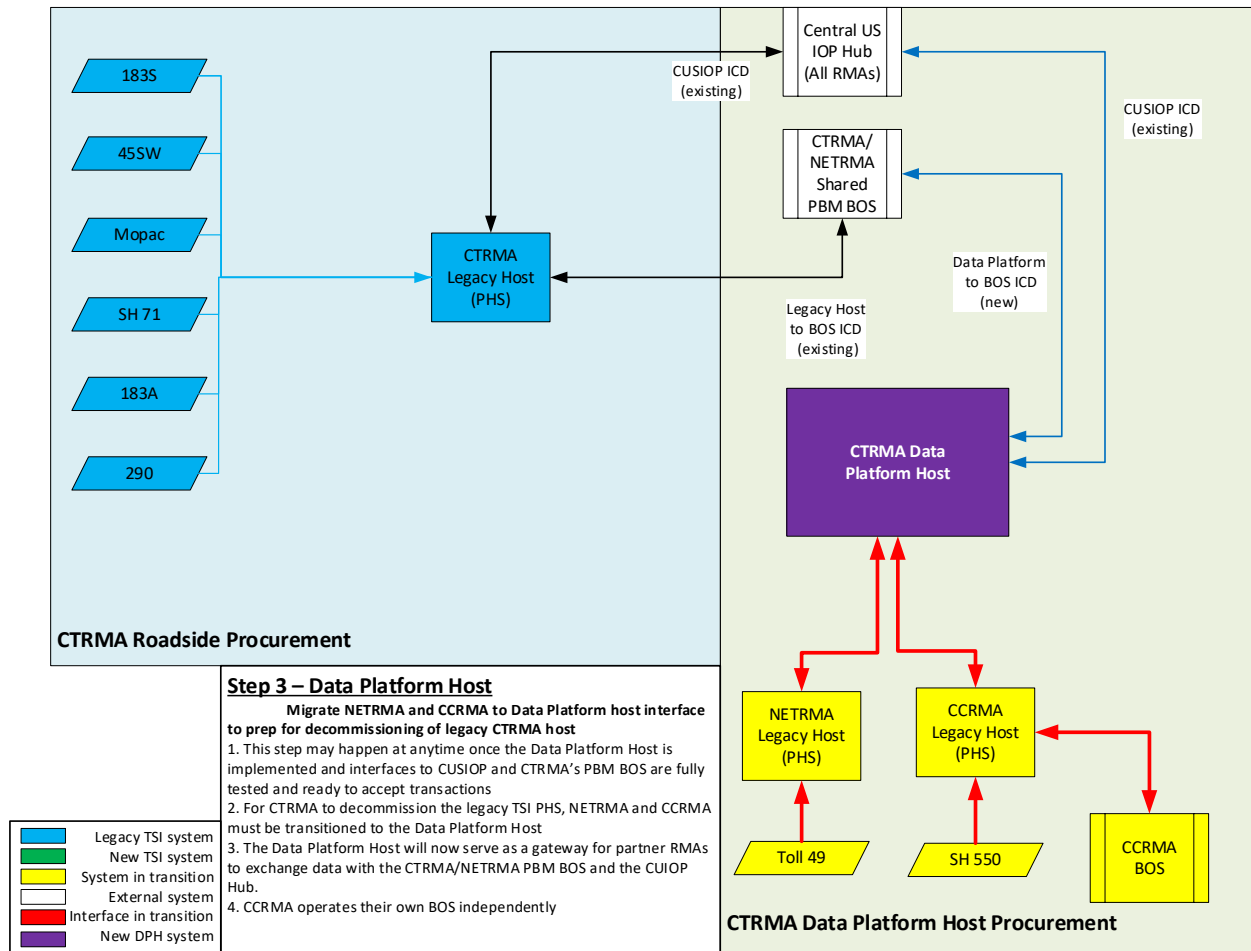


Figure 2-22: Step 3 - Transition of Partner RMA interfaces from legacy TSI Host

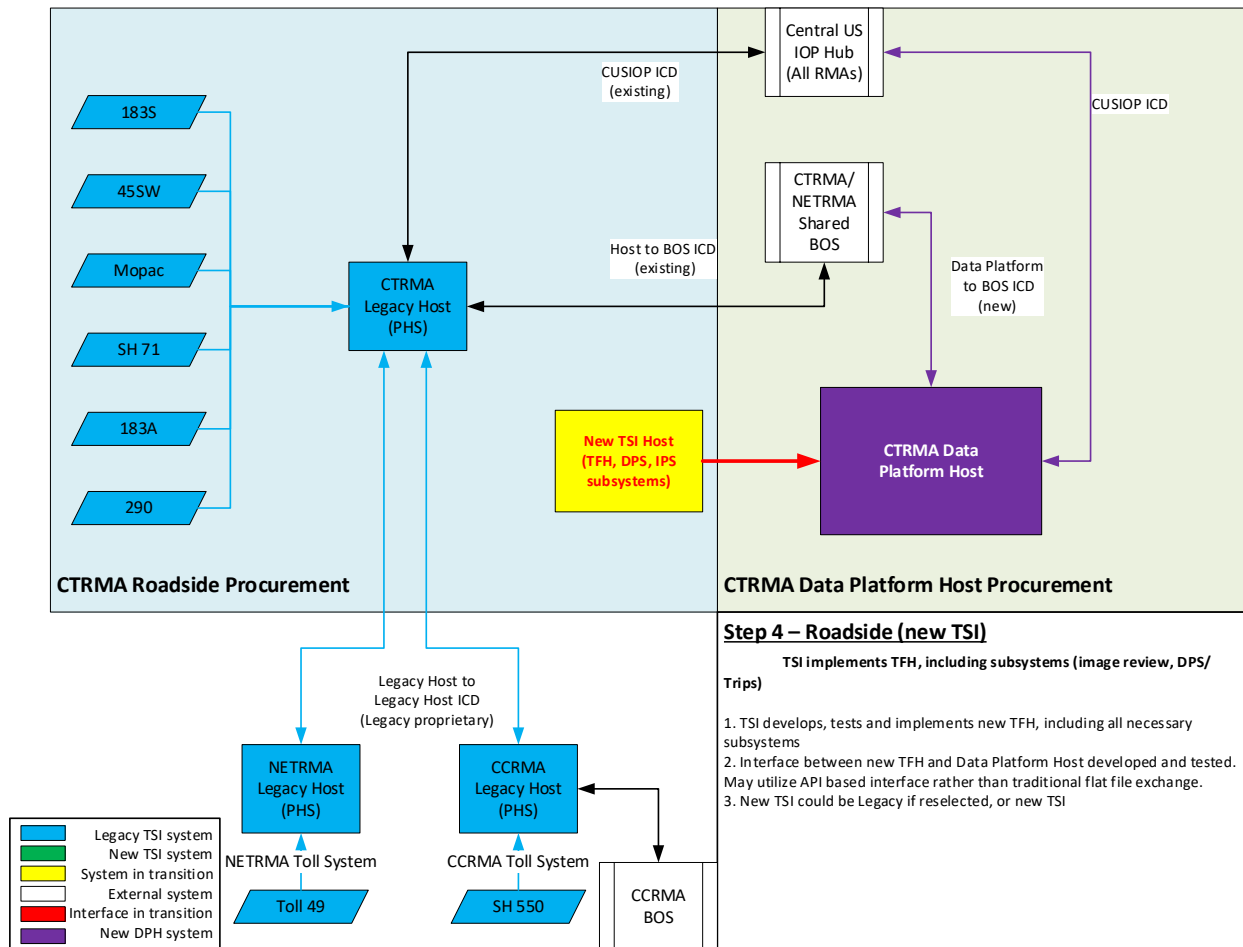


Figure 2-23: Step 4 - New TSI designs, develops, tests, and integrates the new TFH

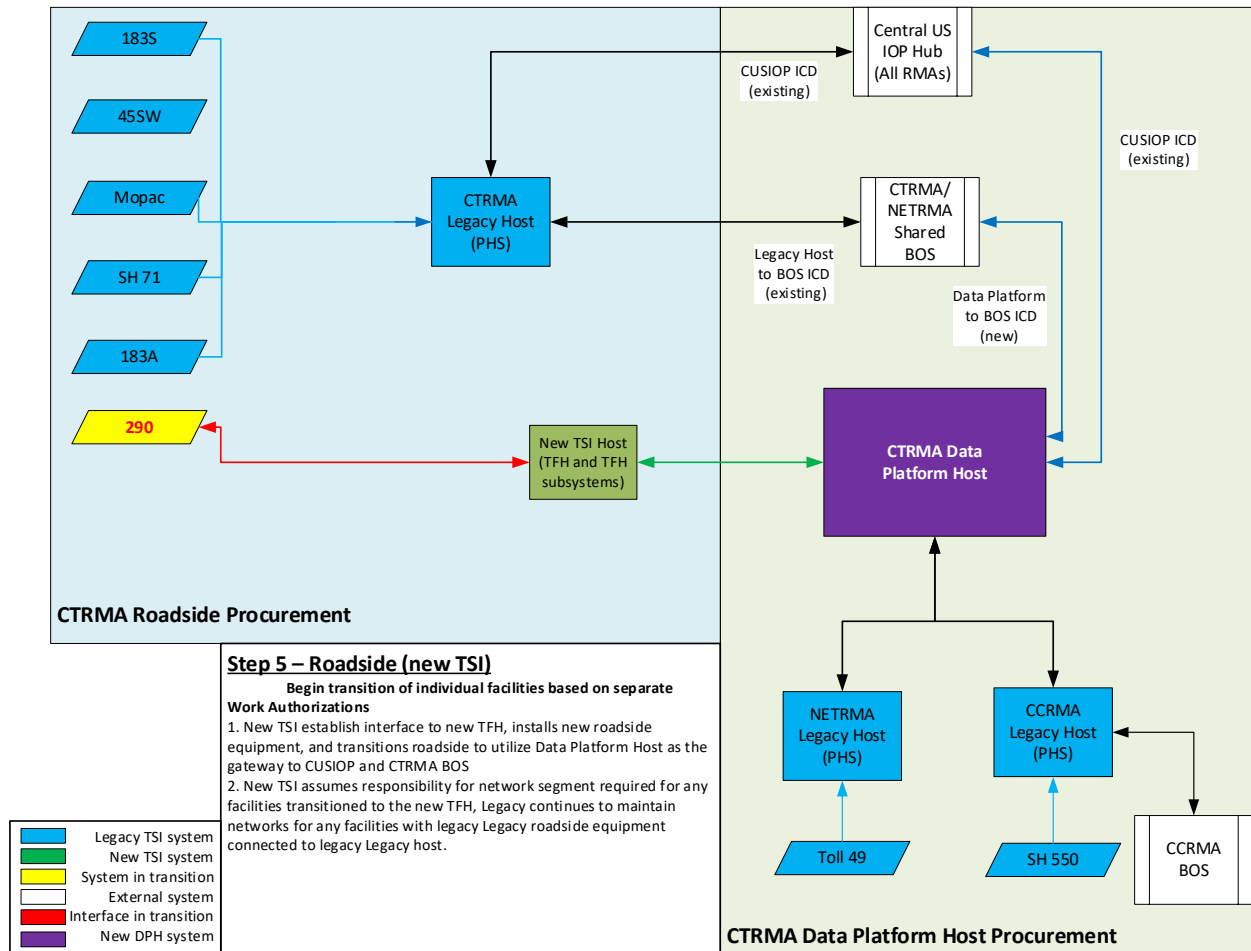


Figure 2-24: Step 5 - TSI begins the transition of the first facility

2.9.6.2 Phase II Transition

This phase includes all field equipment installations on the remaining CTRMA facilities, on-site testing, and debugging and commissioning testing. The transition of each phase requires Work Authorization development and approval by CTRMA.

Phase II toll facility conversions may occur in the order shown in Table 2-51. The following schedule is based on original installation dates and expected EOL dates for the installed equipment. The EOL dates represent the maximum duration the existing equipment may remain in use based on the TSI’s proposed Transition Plan and reuse of currently installed TSI equipment before it must be replaced. This schedule may be adjusted (accelerated or reordered) based on the TSI’s proposed alternative transition schedule and agreement by CTRMA.

Table 2-51: Phase II Transition Schedule

Facility	Hardware Refresh Year	Equipment life expectancy (+7 years after installation)
290 Toll	2015 and 2020	2022 and 2027
183A Toll	2017 and 2018	2024 and 2025
71 Toll Lane	2017	2024
MoPac Express Lane	2017	2024
45SW Toll	2019	2026
183 South Toll	2019, Phase 2 2020 (<i>under construction</i>), and Phase 3 2022 (<i>under construction</i>)	2026, 2027 and 2029

This phase includes all field equipment installations on the remaining CTRMA facilities, on-site testing, and debugging and commissioning testing.

Table 2-52: Phase II Transition Steps

Step	Phase II Activities	Reference Figure
Step 6 (TSI)	<p>Transition of existing toll facilities to the new TFH continues:</p> <ol style="list-style-type: none"> 1. Transition of the existing toll lanes to the new Toll Facility Host continues. 2. Transactions are forwarded from the new TFH to CTRMA’s DPH. 3. The transition of each facility is managed with individual Work Authorizations approved by CTRMA. 4. As each facility is transitioned, the TSI is responsible for SLAs and maintenance. 	Figure 2-25
Step 7 (TSI)	<p>Complete transition of existing toll facilities:</p> <ol style="list-style-type: none"> 1. Transition of the existing toll lanes to the new TFH continues until all facilities are transitioned. 2. All transactions are forwarded to CTRMA’s DPH. 3. Complete network is transitioned over to the new TSI. 	Figure 2-26

Step	Phase II Activities	Reference Figure
	4. The new TSI is responsible for all Legacy Plazas across all the CTRMA facilities. 5. Legacy TSI no longer has access to any aspect of the Legacy ETCS or network. 6. All the spare parts of CTRMA have been transferred over to the new TSI. 7. All reporting, audit, and reconciliation is now through the new TFH and DPH.	

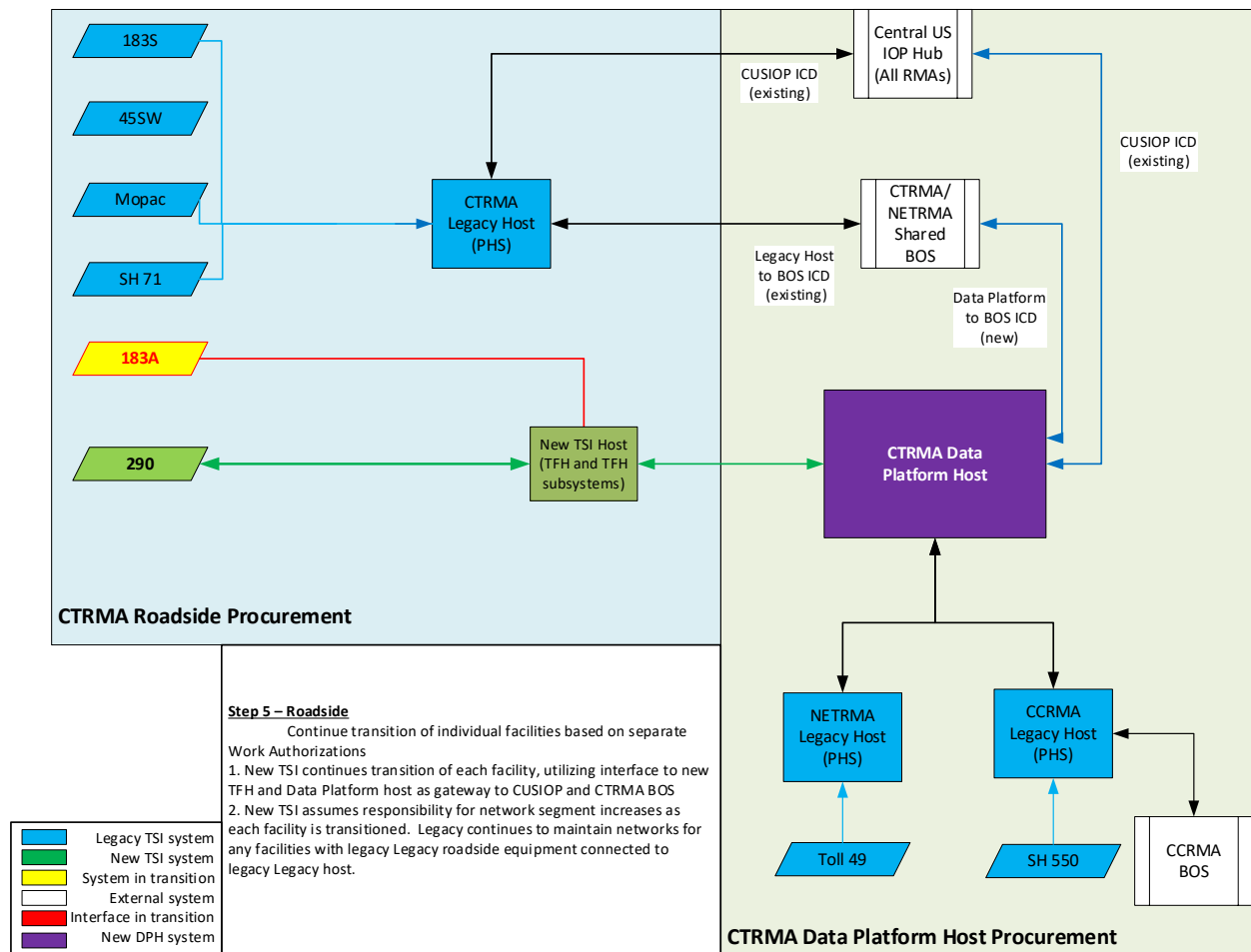


Figure 2-25: Step 6 - Transition of existing toll facilities to new TFH continues

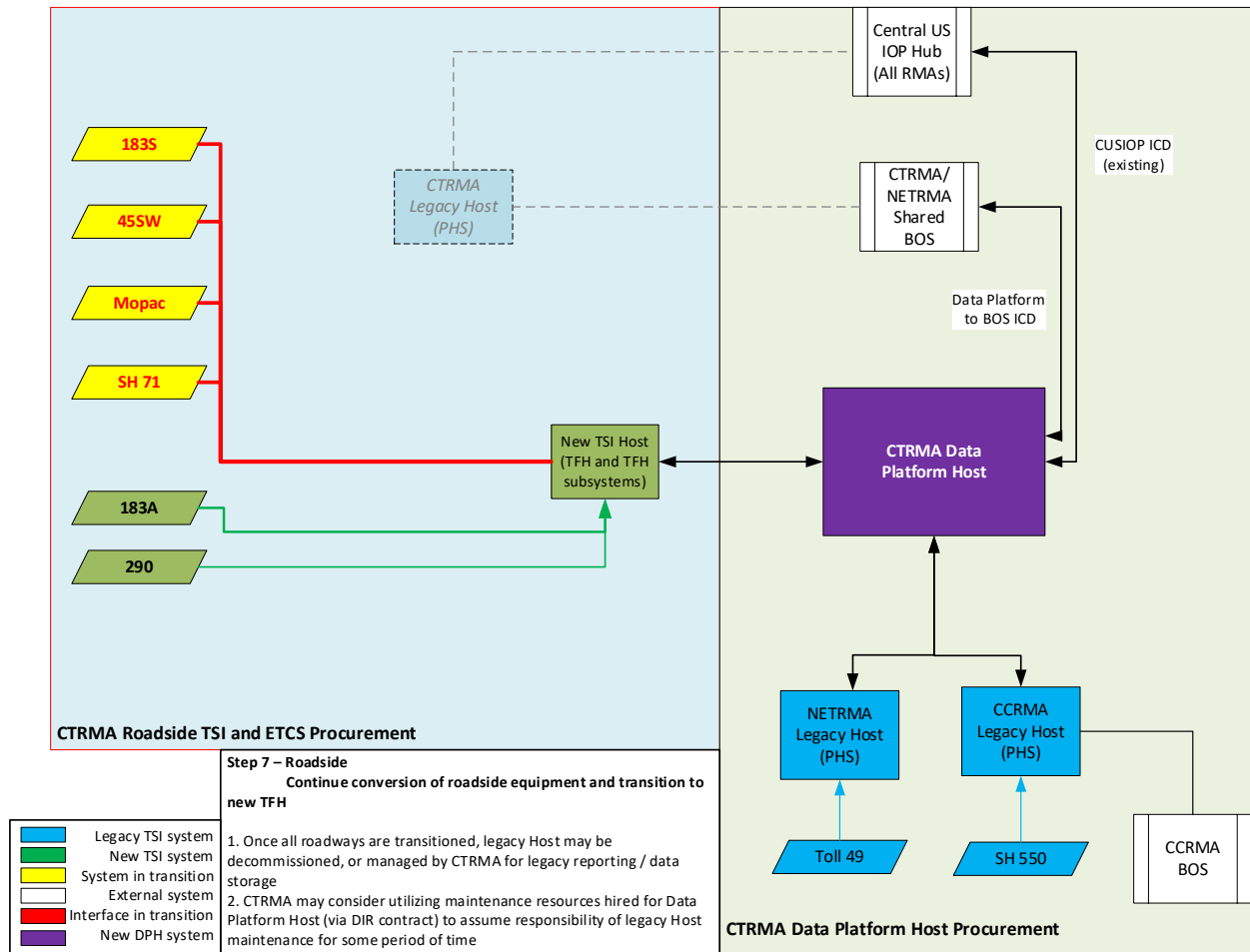


Figure 2-26: Step 7 - Complete transition of existing toll facilities

2.9.6.3 Phase III Transition

Phase III is a period of thirty (30) days after Phase II is completed. This phase shall act as a “Closeout” phase for the Work Authorizations. Phase III will be considered complete when the TSI has provided a letter of closeout demonstrating the following:

- Met the criteria of each milestone trigger in the C-60 Payment Milestone
- Provided a monthly performance report for each of the production plazas within the previous thirty (30) days
- Confirmed there are no open P1/P2 defects at the time of the closeout request

Table 2-53: Phase III Transition Steps

Figure 2-27: Step 8 – Final System Acceptance of complete ETCS

2.10 MIGRATION/MIGRATION PLAN (REMOVED FROM SCOPE OF WORK)

The data migration requirements have been removed from the RFP scope until further discussions can occur with the selected system integrator. CTRMA plans to migrate the majority of the data to the DPS.

2.11 PROJECT DOCUMENTATION

CTRMA will accept no more than three (3) original first submittal documents from the TSI per review cycle. CTRMA shall accept additional documents within a review cycle provided the additional documents represent materials previously reviewed by CTRMA, and now contain new TSI updates that address CTRMA comments.

The TSI shall maintain a tracking tool, posted in an accessible location to CTRMA, for maintaining document submittal and review status. The TSI shall update the tool weekly for document submittals in a two (2) week look ahead, and in real-time for submittals sent to CTRMA for review, and for reviewed documents received from CTRMA.

Note: The Transaction Aggregation functionality is an option to be determined by CTRMA. If CTRMA decides for the TSI to implement transaction aggregation, this functionality shall be addressed in the appropriate documentation, including testing.

2.11.1 Requirements Traceability Matrix

The TSI shall prepare and submit a Requirements Traceability Matrix (RTM) during the system requirements and design phase of the project. The RTM shall document, at a minimum, the following:

1. All requirements as described herein with a unique ID and unchanging number.
2. The intended primary and secondary (if any) means used to verify the requirement, such as inspection (I), analysis (A), demonstration(D), or test (T).
3. The uniquely identified test procedure or script number used to verify a requirement.
4. The date verified (to be used during testing and verification).

The RTM shall trace verification of all requirements contained in the RFP back to their source (e.g., RFP, or Business Rule, or via discovery) and forward to their design element and eventual test cases.

The RTM shall include the following, at a minimum:

1. System requirements shall reflect its associated RFP section numbers for each requirement (to lowest level section).
2. Business rules shall be linked and can be traced to its associated system requirements.
3. Derived requirements from CTRMA's Business Rules that cannot be linked to the RFP system requirement.
4. Engineering requirements derived from RFP requirements that result in a testable set of requirements.
5. Design elements contained in the SDDD (to lowest level section).

6. Verification method.
7. Test cases as applicable per verification method.
8. Training modules as applicable.
9. The TSI shall maintain the documentation traceability of RTM by the document management system and as part of change control for the duration of the contract. In this way, a change order or defect/deficiency fix or repair could result in changes to other components or system elements and therefore require an update to the RTM. Refer to Section 2.7.6.5 for more information on the document management system. After system acceptance, the TSI shall provide any changes to the RTM. These changes shall be submitted to CTRMA for approval.
10. The TSI shall update the RTM for each facility Work Authorization and through the maintenance period.

The TSI may include additional tracing elements information in the RTM to assure all requirements are accounted for as part of the design and development phases before commencing system testing.

2.11.2 Interface Control Documents

As part of the requirements phase for the project, the TSI shall define a list of interfaces and related requirements for the project. During the design phase, the TSI shall develop appropriate ICDs for CTRMA's review, comment, and approval. These ICDs shall fully describe the interfaces, including file formats, message delivery guarantee structure and receipt acknowledgment, error checking and handling, retransmission procedures, archiving, and other related specifications.

These ICDs shall address the physical, functional, and performance aspects of all interfaces. Data flow diagrams shall be used to illustrate the objectives of the interface. The ICD shall provide information on the proposed security protection consistent with the public exposure of the interface data.

The TFH shall be required to interface with CTRMA's DPS.

2.11.3 System Detailed Design Documents (SDDD)

As part of the design phase of the project, the TSI shall submit an SDDD that provides the proposed system architecture, design specifications of all equipment, hardware, and communications/network gear, and a description of the software functionality and associated data flow. The development of the SDDD shall begin with a thorough discovery process for capturing and updating all applicable CTRMA Business Rules and requirements. The CTRMA Business Rules can be found in Appendix 10, Lane System Business Rules. Proposed items and equipment shall meet electrical, communication, and environmental requirements and shall be compatible with expected loads, exposure, and peak usage. Software design shall describe the various modules intended to provide functionality and processing, as required by CTRMA.

The SDDD shall present the logical design of the ETCS, including data flow diagrams for various processing queues, entity-relationship diagrams, and the data dictionary.

During the design phase of the project, the TSI's draft submission shall be followed by an initial review and comment period, after which design reviews shall take place. Upon completion of design reviews, the SDDD shall be revised and re-submitted to CTRMA for final review and approval.

The SDDD shall include the following, at a minimum:

1. The specification sheets for all equipment, including a full hardware manual set for all COTS hardware and compliance matrix, relative to requirements
2. Full description for all COTS software, including software manual sets
3. Computer/server sizing and design details
4. The system, subsystem, and module-level descriptions and interaction between modules
5. Comprehensive schema describing the database(s)
6. Business Rules
7. The requirements for all peripheral device interfaces
8. Description of system diagnostics, status monitoring, and error handling.
9. Description of redundancy and failover processes
10. Interface Control Documents
11. File and transaction and maintenance message formats
12. User interface design, including menus and screens
13. Database design including entity relationship modeling and data dictionary
14. Data integrity assurance plan
15. System and physical security design description and layout
16. Data communications/network diagram highlighting proposed changes and interconnection points
17. Estimated data communication load and existing bandwidth capacity

The SDDD shall include the following network administration information:

1. Network architecture with a graphic representation of all hardware components, their interconnections, and identify interfaces to other toll system elements as well as any external systems.
2. Provide data loading analysis that identifies the type, amount, and frequency of data transmission as well as the data flow through all communications paths. An analysis of bandwidth requirements for each data path shall be provided.
3. Detailed diagrams and technical specifications of network components, hardware, software, communications protocols, and network topologies to be used in the system design.
4. Techniques utilized to ensure the network(s) shall meet the volume of transaction/data traffic to meet the system performance requirements.
5. Rack, cabinet, and enclosure layouts for each network location, including the dimensions of each.
6. Tools and processes used to detect and isolate failures.

The TSI shall provide read-only database access of the production system or another database instance where the data is recent up (to a day old) to authorized users of CTRMA and its third-party consultants. The TSI shall provide cut sheets for all equipment that is provided for the ETCS and, where cut sheets are not available, links to web sites with product details, specifications, and requirements shall be provided.

The TSI shall submit the as-built SDDD, including all changes made during the software development, installation, and testing phases per Appendix 13, Project Deliverable Schedule.

As the new facilities come online, the TSI shall update the as-built documentation through the document management system.

2.11.4 Disaster Recovery Plan

The TSI shall provide a Disaster Recovery Plan (DRP) for CTRMA's review, comment, and approval. The DRP shall include the following, at a minimum:

1. Initial subsystems damage assessment procedure and checklist
2. Architecture and description of redundant subsystems and failover processes
3. Maximum successful failover time to DR/redundant site as confirmed by annual failover testing 8 hours
4. Roadside equipment data latency assessment.
5. Emergency contact list
6. Personnel roles and responsibilities
7. Details of the procedures/processes used in the event of the complete destruction of a TFH site, including relocation plans
8. Business Continuity Plan
9. The disaster recovery plan shall be kept current throughout the life of the contract and tested as part of Integration testing, and annually thereafter

2.11.5 Backup, Recovery, and Data Archive Plan

The TSI shall develop and submit a Backup, Recovery, and Data Archive Plan during the design phase of the project for CTRMA's review and approval. This plan shall address all aspects of the backup, recovery, and archive strategies and processes, including the following:

1. Backup and recovery plan for all applications, databases, and storage subsystems
2. Backup and recovery plan for all roadside subsystems (e.g., zone controllers and VES data processing units/controllers)
3. Integration with MOMS to include alerts and notifications of the success or failure of backup systems or jobs
4. Details on data archiving: disk to disk, disk to selected media, and rotational schedule of selected media and offsite storage as well as the frequency of full and incremental data backup for all servers/systems

The TSI shall demonstrate the Backup, Recovery, and Data Archive Plan during system integration testing, and then annually after that. CTRMA or the CTRMA-designated representatives shall witness this demonstration.

2.12 TRAINING PROGRAM

The following sections provide information regarding the training program.

2.12.1 General Training Requirements

The TSI shall provide training designed to educate the CTRMA-designated personnel in the operation, use, and maintenance of the ETCS. A training course and materials shall be designed to support training during the implementation phase.

CTRMA shall provide a facility for conducting the training session. The TSI shall make reservations for any use of the CTRMA training rooms in advance. The training session can only be conducted between the hours of 9:00 am to 3:00 pm Monday through Friday. The TSI shall plan the training course, content, and resources such that up to six (6) trainees could be trained at once. The TSI shall provide its training equipment, including projectors and laptops.

The TSI shall deliver and maintain training materials including instructor guides, student workbooks, self-guided tutorials or videos, and all training course content including visual aids, technical manuals, diagrams, PowerPoint presentations, and loose handouts as needed for any TSI delivered training. The TSI is responsible for any needed updates to training materials discovered during live training sessions. All training course content, training materials, and documentation shall be reviewed and updated as needed to stay current as part of any change orders and as part of the maintenance of the RTM. On an annual basis, training content that is no longer relevant shall be purged from the training curriculum. Any changes or purging of training content shall be pre-approved by CTRMA.

2.12.1.1 Training Plan

The TSI shall develop a Training Plan for CTRMA's review, comment, and approval. The Training Plan shall include a sample training course with sample training materials so that CTRMA can review and provide comments on the TSI's training content delivery methodology and the overall intended look and feel of training content and materials. The TSI shall submit and gain comments and approval on its Training Plan before developing and submitting the individual training courses to CTRMA for approval. Additionally, the Training Plan shall provide the following for each training course:

1. The purpose of the course
2. The qualification requirements for the trainer(s) and the intended audience
3. Course content outline/summary
4. Estimated training course duration
5. Training materials to be provided
6. All equipment required for delivery

7. Any logistical requirements, such as if the training is to be conducted in a classroom or roadside

Following the approval of the Training Plan, specific training course content and materials shall be submitted to CTRMA for review, comment, and approval. The training course shall be included as an addendum in the Training Plan and shall be customized to meet the needs of the intended audience.

Once the course is approved, the TSI shall produce sufficient copies of the training course material as needed to accommodate the estimated number of personnel who shall attend each training class and maintain a reproducible set of documentation electronically as part of the RTM. The Training Plan shall include how all training materials shall be generated and maintained electronically over time so that at the end of the contract, all training materials are current. Additionally, the Training Plan shall describe how the TSI's training staff shall coordinate with the TSI's documentation and requirements traceability resources to ensure all training content is maintained as part of the RTM.

2.12.1.2 Training Course

The TSI shall provide, at a minimum, the following training course for CTRMA's review, comment, and approval. The training course shall be developed, reviewed, and updated based on CTRMA's review and comments, and added as addendums to the Training Plan.

The courses shall provide students with an understanding of the ETCS, including hands-on training. These courses are designed primarily for the CTRMA managers, public information and marketing staff, Information Technology (IT) personnel, and others who require a basic understanding of the entire ETCS. These courses shall discuss system functionality, including, but not limited to, the lane, the TFH, trip building, and dynamic pricing, user, and other relevant interfaces.

These courses shall be offered three times during the Training Program and shall provide information on the following:

1. High-Level Overview of Entire Solution
 - a. TFH
 - b. Interfaces
 - c. Roadside System
 - d. Digital Video Audit Systems (DVAS) system
 - e. Audit and Reconciliation
 - f. Dynamic Pricing and Trip Building
2. Reporting
3. MOMS

2.12.1.2.1 Training Program Delivery Schedule

The TSI shall develop a training schedule (as part of the project schedule), which identifies the delivery of the full set of training materials, including instructor guides, student workbooks, and all training course content for CTRMA's review, comment, and approval.

Additionally, all courses (training material, manuals, and training classes) must be delivered to the CTRMA trainees to ensure that CTRMA and their authorized representatives are adequately prepared to evaluate system performance before and during system integration and OAT.

All training courses must be completed before System Integration Testing (SIT).

2.13 SYSTEM TESTING

The TSI shall conduct testing of the ETCS to validate functionality, availability, reliability, accuracy, and compliance to the requirements of this RFP or any changes to requirements due to change orders or break/fix activities. This includes all functionality delivered by the proposed ETCS and all third-party components.

The TSI shall conduct internal tests of the ETCS and interfaces (dry runs) following approved test plans and procedures before CTRMA observes formal test phases. Internal (dry run) testing shall be successfully completed by the TSI no less than two weeks before the formal test phase that it precedes. The TSI will provide the results of these dry runs to CTRMA before the commencement of the formal and observed tests. CTRMA may require the TSI to re-run the internal tests before conducting a formal and observed test if the preliminary test results do not indicate the test would be passed per the test plan and procedures.

The TSI shall document, by way of an issues list, all defects and issues discovered during formal and observed test phases. All issues and defects shall be assigned a resolution date and severity/priority level. This issues list shall be provided to CTRMA within two (2) days of completion of the formal test phase. The TSI shall be responsible for tracking all defects and issues found during all testing phases until a complete resolution is reached with CTRMA's approval. CTRMA may require that updates to this issue list be submitted to CTRMA and software demonstrations performed to verify that the updates have been completed. All defects must be fixed, tested, and resolved to CTRMA's satisfaction in each formal test phase before moving onto the next phase of testing or final system acceptance. At CTRMA's sole discretion, minor defects may be allowed to be scheduled for resolution after the completion of a formal test phase.

The TSI shall maintain and have readily available a test environment operating the current ETCS production software version for the duration of the contract, for the following, at a minimum:

1. Change order deployment and demonstration
2. Defect triage and break-fix
3. Toll Interoperability changes
4. Third-party interface testing

2.13.1 Master Test Plan

The TSI shall submit a Master Test Plan to CTRMA for review, comment, and approval. This Master Test Plan shall provide the standards for developing individual test plans and procedures for the different phases of formal testing. These standards shall describe how each formal test shall be conducted, document test procedure format, discrepancy/issue/defect

severity level definitions, discrepancy/issue/defect tracking, and the entry, exit, and acceptance criteria for each test phase. CTRMA must approve entry and exit criteria for all test phases. All functionality delivered by the ETCS shall be demonstrated/tested, and the Master Test Plan shall describe these demonstrations and guidelines for creating test procedures in the individual test plans. The Master Test Plan shall describe the overall testing strategy and test procedure standards, whereas each formal test shall have its own test plan comprised of detailed test cases and procedures.

The TSI shall use the following priority levels with associated descriptions for all test phases and describe their approach to the handling of these priority levels in the Master Test Plan.

1. **Priority One:** A defect that stops the execution of an individual test and causes the execution of related tests not to be executed. This class of defect is reserved for problems that require testing to stop and shall be used only for the most critical of defects. Typical characteristics of this class of defect include the following:
 - a. The defect is related to a legal or revenue issue that must be resolved before deployment. The system cannot go into production until the defect is fixed.
 - b. The defect will result in a customer-facing issue for CTRMA.
 - c. It will directly impact users or operations in a major, noticeable way.
 - d. It occurs (or will occur once the application is released) quite often (e.g., daily) in actual production or simulation.
 - e. There is no real workaround.
 - f. The defect causes downtime to the point the applicable availability SLAs is not able to be met for the OAT period.
2. **Priority Two:** A defect that stops the execution of an individual test but does not affect the execution of other related tests. This may also be a defect that blocks any test or presents an unavoidable problem, preventing a user from completing the required tasks. Typical characteristics of this class of defect include the following:
 - a. It directly impacts users, or operations, in a major, noticeable way.
 - b. It occurs (or will occur once the application is released) fairly often (at least once a week) in actual production or simulation.
 - c. The problem causes application downtime or blocks test/test sets.
 - d. There is no real workaround, or there is only one workaround that requires significant effort on the part of the user.
3. **Priority Three:** A defect for which a workaround is available. The actual results of current tests are not as expected, but the defect does not prevent the continued execution of the tests. Includes defects that impact the system or subsystem, but the system or subsystem is still able to perform without an immediate fix. Typical characteristics of this class of defect include the following:

- a. It occurs (or will occur once the application is released) less often than weekly in actual production or simulation.
 - b. The defect does not cause significant application downtime.
 - c. The defect is not functioning as documented or expected.
4. **Priority Four:** A cosmetic defect whose occurrence does not indicate a lack of or deviation from required functionality, but a cosmetic change or enhancement is requested. Workarounds are available so that system users can avoid these defects. Typical characteristics of this class of defect include the following:
- a. It relates to content, documentation, or other "non-application" aspects of the system or subsystem.
 - b. If functionally related, the problem seldom occurs (or seldom will occur once the application is released) in actual production or simulation.
 - c. Users have not noticed, or are unlikely to notice, that there is a problem.

As design and development activities take place, testing strategies and plans may change and require revisions. As such, throughout the implementation phase, updated versions of the Master Test Plan and related test documents (individual test plans and final test reports) shall be revised or appended to the Master Test Plan and delivered to CTRMA for review and approval. In this way, the Master Test Plan will stand as a record of all testing performed during development, implementation, and acceptance. After OAT, system testing shall be managed as part of the TSI's QMP. This plan shall address QA testing and regression testing to verify changes to the ETCS, including equipment, hardware, application, database, operating systems, COTS upgrades, and all types of patching.

Formal tests shall conform to the standards defined in the Master Test Plan. For formal tests that require test cases/procedures (e.g., FAT, Commission, and Integration testing at a minimum), test cases/procedures shall include the following elements, at a minimum:

1. Introduction
 - a. Test purpose
 - b. Test platform (including required equipment, environmental resources, and connectivity)
 - c. Requirements to be demonstrated (cross-referenced to the RTM)
 - d. Time estimate
 - e. Prerequisites
 - f. Set-up and test data preparation needed
2. Individual Test Conditions/Steps
 - a. Description of steps to execute the test case
 - b. Expected results for each step
 - c. Actual results and the party responsible for executing the test (entered after test execution)
 - d. Pass/Fail checkbox for each step
 - e. Notes/comments

As test cases for specific formal tests are developed, they shall be submitted to CTRMA for review, comment, and approval. Once approved, the test cases (and later the results) shall be added to the Master Test Plan as addendums.

2.13.2 Test Reports

No more than ten (10) days following the completion of each formal test, the TSI shall submit a Test Report to CTRMA for review and approval. The Test Report shall describe:

1. Test phase (e.g., FAT, SIT, OPS)
2. Description of the testing process
3. Results of the test
4. Listing of all defects identified along with the severity level of each defect
5. Plan for resolving defects
6. Recommendation for retests (if appropriate)

The final approved test report for each formal test shall also be added to the Master Test Plan. CTRMA reserves the right to withhold approval and any associated payments pending completion of corrective action and any necessary retests.

During FAT and SIT, the TSI shall submit daily progress reports that contain the following:

1. Total test cases executed
2. Total test cases closed (% complete)
3. Total defects opened
4. Total defects closed
5. Remaining open defects by priority

2.13.3 Factory Acceptance Test

The TSI shall conduct a Factory Acceptance Test (FAT) to demonstrate that all requirements and functionality have been incorporated into the ETCS. FAT shall demonstrate to CTRMA the full functionality of the ETCS operating in a test environment with hardware and software representative of the final system as deployed to and running in production. The FAT will demonstrate all requirements of the system, as documented in the RTM and the SDDD. The FAT will include a system performance test that demonstrates that the system will handle twice the expected transaction volumes, as taken from the existing CTRMA facilities. CTRMA or CTRMA's representatives will observe the formal FATs.

All ETCS functionality, including roadside, TFH, capacity/performance, interfaces, and ease of use (GUIs), shall be tested and demonstrated during FAT. All system reports shall be generated from the ETCS to verify that delivered reporting functionality meets the requirements. Reports testing shall utilize test data sets. Internal and external interfaces shall be observed and verified against requirements and for data accuracy. As the availability of third-party interface providers to support FAT testing may be limited, interface testing during FAT may be simulated if approved by CTRMA.

FAT shall be conducted in two (2) stages. One stage shall be for lane-level systems (e.g., roadside) and another stage for TFH systems (e.g., reporting, dynamic pricing, and trip building). CTRMA and the CTRMA-designated representatives shall have access to all FAT test sites and data generated during this testing.

CTRMA will observe all ETCS FAT testing. If the TSI fails some portion or all of FAT, and CTRMA desires a retest, then the TSI shall be held accountable for any costs incurred by CTRMA to support and observe the additional FAT event(s).

2.13.3.1 FAT Plan

The TSI shall develop a FAT Plan, including test cases and procedures designed to demonstrate all functionality and requirements of the fully operational ETCS operating in a factory/test environment. The TSI shall submit the FAT Plan and Procedures to CTRMA for review and approval. The FAT Plan shall include descriptions of both roadside and Host FAT and how the two different tests shall be conducted and scheduled, along with a schedule that includes a day by day listing of the different sub-systems, modules, and interfaces to be tested. The FAT Plan and Procedures shall include the requirements to be tested along with the expected results, a description of test data used for functional testing, and a description of the priority levels used for classifying and recording any defects noted during FAT.

2.13.3.2 Host FAT

As per the requirements in the Installation of New Facilities and Transition sections included herein and above, the Host FAT shall be conducted before any roadside installation or testing. Host FAT will demonstrate that all the Host provided systems (e.g., reporting, dynamic pricing, trip building, roadside interfaces, and third-party interfaces) meet requirements. This test can be conducted in a conference room or similar setting, which shall be witnessed by CTRMA or the CTRMA-designated representatives. The DPE may be demonstrated with rates posting to Dynamic Message Signs (DMS) along the roadside, or with a test DMS unit in a factory environment.

2.13.3.3 Roadside Factory Acceptance Testing

The roadside FAT shall be conducted before the transition of any of the legacy roadside systems to the TSI-provided roadside systems. The roadside FAT will demonstrate the full roadside solution with controlled tests. Roadside FATs shall be carried out for each of the facilities just before the TSI begins roadside installations at the facility.

The TSI may conduct roadside FAT at a low-volume plaza on each of the facilities or at the TSI test facility. The TSI shall be responsible for all costs associated with Maintenance of Traffic (MOT), traffic control, and lane closures to carry out a FAT.

If the TSI chooses not to perform roadside FAT at a low-volume plaza on one of the facilities, the TSI shall demonstrate the proposed system at a test facility representative of the installations expected for that facility located within the continental USA. The test site shall accommodate speeds ranging from stop-and-go up to 75 mph.

The purpose of roadside FAT is to ensure that the AVI systems properly frame vehicles (i.e., closely following, stop and go, straddling, weaving in a plaza), that VES cameras are properly triggered and that images are produced and that vehicles are correctly detected and classified. FAT will include testing of DMS unit and CCTV systems for facilities that have those systems.

2.13.3.4 FAT Report and Approval

Following each FAT, the TSI shall submit a FAT report to CTRMA that describes testing results, including all issues/defects found along with the priority level of each. If CTRMA deems the number or effect of unsuccessful tests to be too large or too severe, the TSI may be instructed to resolve defects, rerun the applicable portion of the FAT, or rerun the entire FAT at the sole discretion of CTRMA.

FAT approval is dependent on the successful demonstration of the complete ETCS as functionally compliant with all requirements and meeting the exit criteria identified in the Master Test Plan/FAT Plan.

2.13.4 Site Installation Testing

For each type of site, the TSI shall submit a site-specific installation test plan to CTRMA for review and comment not less than thirty (30) days before the first in-lane site installation. A site installation test shall be conducted at locations where the complete set of hardware, software, and communications equipment is installed. Once the equipment/components have been

individually tested, the subsystems shall be integrated and tested to include communications with the TFH. The site installation tests shall be conducted by the TSI contractor and witnessed by CTRMA per approved test procedures and the test schedule. The TSI shall submit installation test reports, documents, and artifacts showing activities and results to CTRMA for approval.

This test or an approved subset of this test shall be used as a site commissioning test for the remaining sites.

2.13.5 Integration Test

System Integration Testing (SIT) is an end-to-end test to verify that all ETCS components and interfaces meet functional and performance requirements. SIT is to be performed in a production-ready hardware, equipment, network, and connectivity configuration. For any controlled testing during this phase, previous test procedures from FAT can be reused if appropriate and approved by CTRMA.

All third-party interfaces with the TFH shall be demonstrated during a Host SIT and shall be verified to comply with appropriate ICDs. Test cases and test procedures for Host SIT will demonstrate transactions and images, and all other required data can be sent to the DPS with appropriate validation checks, per the ICD for that platform. All data transmission failure cases with failure codes per the ICD shall be demonstrated, and all system-to-system reconciliation processes shall be demonstrated.

Roadside SITs shall be conducted as each of CTRMA's facilities are fully transitioned to the TSI's roadside ETCS. These roadside SITs will demonstrate that the TSI-provided ETCS successfully communicates all roadside transactions, images, and all other data between the roadside ETCS and the TFH. Data validation checks, with appropriate codes and messages, shall be demonstrated during the roadside SITs.

2.13.6 Operational Acceptance Test

The OAT will also be carried out on a facility-by-facility basis. There shall be an OAT once the TFH goes into production, then there shall be roadside OATs as each of the facilities are transitioned to the TSI's roadside system(s). OAT shall be conducted for a thirty-day period which may be consecutive or non-consecutive as approved by CTRMA with the fully implemented ETCS supporting the CTRMA operations staff.

Each OAT will demonstrate all required availability, accuracy, performance, and that the ETCS meets response requirements. An entry criterion to OAT is that the ETCS is meeting or exceeding all functionality requirements as demonstrated during FAT, commissioning, and integration testing, and all SLAs are being met. Two weeks before each OAT, the TSI shall conduct an OAT readiness meeting for the facility going into OAT with CTRMA to walk through OAT entry criteria and the TSI's readiness. During each OAT, the TSI shall demonstrate all SLAs are being met by way of the SLA reporting requirements described in Appendix 7, Service Level Agreement.

CTRMA shall have access to all data sets and reports used by the TSI to demonstrate compliance with the SLAs during OAT. Once the TFH and all facility/roadside OAT is complete

and has been accepted by CTRMA, the TSI shall perform a final OAT with all the transitioned facilities being included with the production TFH.

The TSI is solely responsible for executing OAT and recording the results. However, at its discretion, CTRMA may observe and report defects during OAT.

If any portion of OAT requires repeated restarts due to no fault of CTRMA, the TSI may be held accountable for any costs incurred by CTRMA to support any additional system acceptance testing period(s).

The TSI shall be given full project acceptance and authorization to initiate maintenance invoicing for the ETCS, either a newly installed or transitioned facility, upon the successful completion and the CTRMA approval of the OAT for that project/facility, closure of all punch-list items, completion, and submission of all required documents, including as-builts and updates to manuals and meeting of other conditions as specified in the contract documents. Maintenance invoices shall only include work performed starting from the date CTRMA issues authorization to initiate maintenance invoicing. Work performed prior to authorization to initiate maintenance invoicing is not considered maintenance, even though the project may be open to revenue collection.

For reference, the following diagrams illustrate the transition from the testing to the warranty phases of the project.

The TSI may not invoice CTRMA for maintenance work performed during the OAT phase prior to OAT completion and full project acceptance. The TSI may not recoup additional maintenance costs for maintenance work performed from the time of Go-Live until CTRMA approval to begin maintenance invoicing due to delays in OAT and full project acceptance.

Scenario 1 represents the completion of Operational Acceptance Testing and full project acceptance thirty (30) days after go-live.

1. Operational Acceptance Test and full project acceptance completed thirty (30) days after the start of revenue collection (go-live)
2. Authorization to begin maintenance invoicing May 1
3. First Monthly Maintenance Report (MMR) due May 10
4. First month eligible for maintenance payment is May
5. Warranty period includes the period after go-live (one month) until full project acceptance and the following twelve (12)-month period for a total of thirteen (13) months

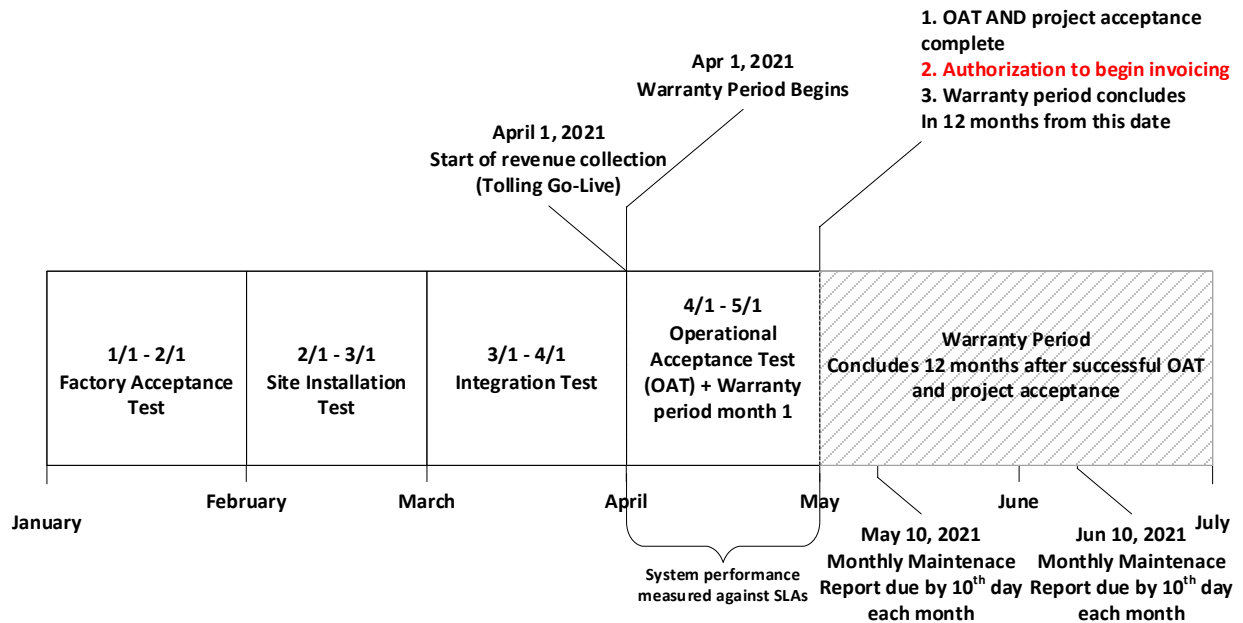


Figure 2-28: Operational Acceptance Test – Scenario 1

Scenario 2

- Operational Acceptance Test and full project acceptance completed sixty (60) days after start of revenue collection (go-live)
- Authorization to begin maintenance invoicing June 1
- First month eligible for maintenance payment is June
- First Monthly Maintenance Report (MMR) due May 10
- The warranty period includes the period after go-live (two months) until full project acceptance and the following twelve (12) months for a total of fourteen (14) months.

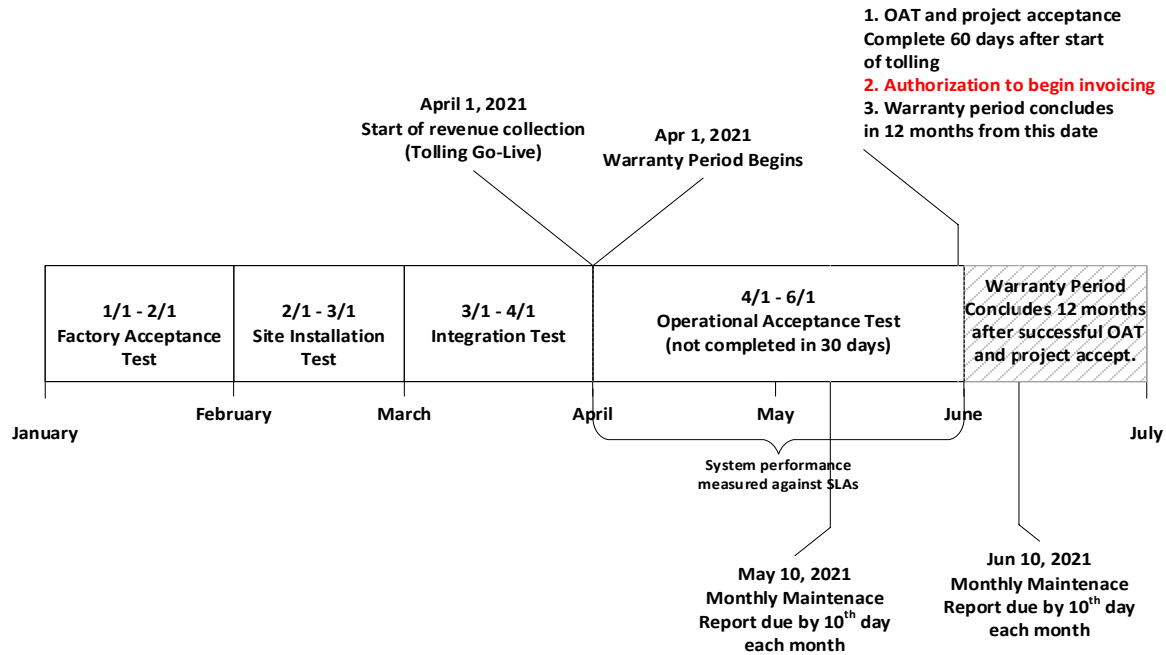


Figure 2-29: Operational Acceptance Test – Scenario 2

Scenario 3 represents the completion of Operational Acceptance Testing sixty (60) days after go-live and a thirty (30) day delay for full project acceptance after completion of the Operational Acceptance Test.

1. Operational Acceptance Test completed sixty (60) days after start of revenue collection (go-live)
2. Full project acceptance completed ninety (90) days after the start of revenue collection (go-live)
3. Authorization to begin maintenance invoicing July 1
4. First month eligible for maintenance payment is July
5. First Monthly Maintenance Report (MMR) due May 10
6. The warranty period includes the period after go-live until full project acceptance (three months) and the following twelve (12)-month period for a total of fifteen (15) months.

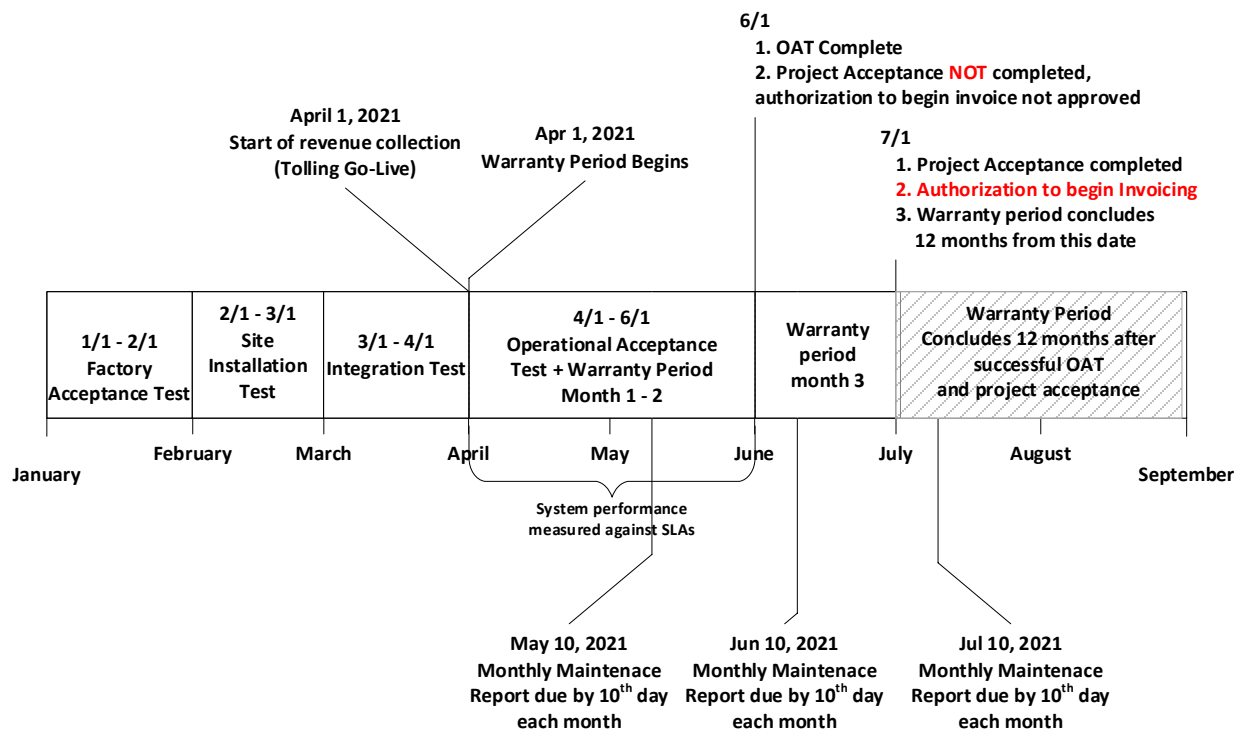


Figure 2-30: Operational Acceptance Test – Scenario 1

2.14 MAINTENANCE

This section provides information regarding maintenance.

2.14.1 General Requirements

The TSI shall provide all necessary maintenance services to support all hardware, software, and network on the ETCS. The TSI shall maintain all Local Area Network (LAN) and Wide Area Network (WAN) network equipment provided by CTRMA and installed and configured by the TSI. The ETCS and associated systems and equipment shall include all hardware and software associated with the following, at a minimum:

1. Electronic Toll Collection System (ETCS) software
2. Zone controllers
3. AVI equipment and subsystems (excluding transponders)
4. AVC equipment and subsystems
5. VES equipment and subsystems
6. Maintenance Online Management System (MOMS)
7. All ETCS network administration, monitoring, equipment, and cables, including the roadside Fiber Optic Network (FON)
8. Roadside equipment cabinets and all associated electronics within the enclosures
9. Roadside security access systems and cameras
10. Equipment mounting and bracket hardware
11. DVAS equipment and systems
12. Express Lane Traffic Sensor (MDS)
13. Express Lane VTMS equipment and system
14. Express Lane CCTV equipment and system
15. Express Lane subsystem hardware and software required for express lane operations, monitoring, trip building, and dynamic pricing functions
16. Workstations, monitors, and printers used by the TSI staff for TIM Center Operations support
17. AC Units/Heaters monitoring and maintenance
18. UPS systems monitoring and maintenance
19. Emergency generators monitoring (note: CTRMA is responsible for generator maintenance)
20. Lane equipment, hardware, and software needed for ongoing development and test support
21. All TFH related servers, equipment, and software

The TSI shall provide maintenance services for the duration of the warranty and maintenance period. These maintenance services include both on-site and off-site services. The TSI shall provide full-time remote help desk support services to assist in troubleshooting and incident/case management for identified software and system issues.

Refer to Appendix 7, Service Level Agreement, for information about the maintenance response and repair times for the warranty and maintenance period.

The TSI shall conduct a bi-weekly maintenance meeting with CTRMA to report operating performance, equipment/system problems, and proposed solutions.

The TSI shall conduct a monthly progress meeting with CTRMA to review the monthly MOMS report, the previous month's work, anticipated work for the next month, and any expected or unexpected operational problems that have arisen. During the monthly progress meetings, the TSI shall identify and communicate to CTRMA all issues affecting the operations or performance of the ETCS. The TSI shall complete root cause analysis and after-action reporting. The TSI shall present how issues arose, were identified, and resolved.

The TSI shall establish and maintain a dedicated maintenance warehouse for this project. The TSI can determine the location of this maintenance warehouse. The location, however, shall allow the TSI to meet the response times outlined in Appendix 7, Service Level Agreement. This warehouse shall serve as the primary location for the storage of any spare parts, consumables, tools, test equipment, repair parts, documentation, and personnel needed to manage and support the ETCS.

The TSI shall provide adequate safeguards against theft, damage, or loss of the CTRMA spare parts in the TSI possession. The TSI shall be responsible for maintaining insurance against loss or damage to the spare parts due to mishandling, improper storage, or theft.

The TSI shall coordinate with the CTRMA operations staff regarding any asset management requests or third-party needs. The TSI shall accommodate unplanned walkthroughs for audit verifications upon request.

The warranty phase shall commence upon go-live (the beginning of revenue collection) and shall include all maintenance and production support for the ETCS. The warranty phase shall conclude after twelve (12) months upon successful completion of the Operational Acceptance Test and full project acceptance of each project/facility, as described in Section 2.13.6 of this RFP. During the warranty period, CTRMA shall receive a full manufacturer's warranty on all hardware equipment. The warranty period shall include all maintenance and production support for the first year of operation. The maintenance period shall begin after completion of the warranty period. The TSI shall ensure that the costs for the warranty and subsequent years of maintenance and production support are separated into individual pricing components in the Pricing Forms in Appendix 6, Price Proposal Forms.

2.14.2 Maintenance Plan

The Maintenance Plan shall include all processes and procedures used to manage, staff successfully, and conduct the ETCS maintenance per the requirements outlined in this RFP. The TSI shall be responsible for maintaining an updated version of the plan for the duration of the project contract. The plan shall address the following, at a minimum:

1. A description of the maintenance methodology and approach
2. Maintenance Team organizational chart and staffing schedules
3. Maintenance regions (if they exist) and staff assignments
4. Specialized tools (if required)
5. A description of MOMS and any other methods used to monitor the ETCS, including priority levels for the response to alarms, dispatching protocol, and sample reports and screens
6. A schedule for the routine maintenance activities the TSI shall perform per the maintenance schedule
7. The maintenance schedule provides information and descriptions of the emergency/corrective, predictive, and preventive maintenance activities for all system components
8. Contracted maintenance relationships. CTRMA must be notified of any TSI-teaming agreements or arrangements to ensure adherence to the project requirements and expectations
9. Maintenance support groups
10. Personnel contact information
11. Staff locations
12. Staff qualifications
13. Description of the staff training
14. Maintenance facilities/workshops
15. Procedures to be used for planning and implementing lane closures
16. Description of maintenance activities executed during peak traffic periods, including how this affects response time and performance of traffic management
17. Software Lifecycle Management
18. Hardware Lifecycle Management
19. Process for responding to force majeure events and repairing damaged systems during the next maintenance window
20. Maintenance record keeping
21. Failure tracking and corrective action
22. Reliability and maintainability analysis and calculations
23. Maintenance activity reports
24. End of project checklist verifying all products provide the current version and include any executed service contracts

This Maintenance Plan shall describe routine, preventive, and corrective maintenance along with maintenance repair procedures and checklists. The Maintenance Plan shall describe how the functionality of MOMS identifies, dispatches, responds, restores, and records an incident or service event. The SLAs specify the maintenance response times, and the plan shall communicate the TSI's processes to meet these response times. The Maintenance Plan shall also address spare parts in inventory management.

The TSI shall update the Maintenance Plan yearly to reflect any new operational practices and newly installed hardware/software that may affect the TSI's maintenance activities.

2.14.3 Monthly Maintenance Report

At the end of the first full month after go-live, the TSI shall submit a Monthly Maintenance Report (MMR) for CTRMA's review. The TSI shall provide one Monthly Maintenance Report, with subsections within that one report for each project/facility. As described in Section 2.13.6, the TSI shall not begin maintenance invoicing until the successful completion of the Operational Acceptance Test and full project acceptance by CTRMA.

The MMR shall include the following, at a minimum:

1. Monthly performance measurements for all defined SLAs
2. TSI calculated monthly liquidated damages (LD)
3. Mean Time to Respond and Repair (MTTRR) calculations, including exceptions and justifications
4. Access to all reports/data used by the TSI in support of the MMR
5. Corrective, preventive, and predictive maintenance activities performed each month
6. Work orders, including the assigned technicians and associated repair times
7. Work plan/scheduled preventive maintenance for the following month
8. Information on the battery health of the UPS equipment
9. Spare parts used/items return to vendors under CTRMA
10. Inventory report

CTRMA must approve format and content before the first submittal.

2.14.4 Maintenance Staffing and Location

As part of the Maintenance Plan, the TSI shall identify the number of remote and local software, hardware, and network maintenance personnel assigned to each job category, including the following:

1. Technical Supervisors (local position)
2. Network and systems engineers (either local or remote position)
3. Database and systems administrators (either local or remote position)
4. Field staff (local position)

2.14.5 Tools, Electronics, and Transportation

The TSI shall provide all necessary and appropriate vehicles to support the ETCS. The vehicles shall contain the necessary equipment, machinery, tools, test equipment, spare parts, repair parts, and consumables necessary to perform all tasks, including overhead work.

The TSI shall be able to accommodate that not all locations have leveling pads for bucket trucks. For future CTRMA projects, provisions for leveling pads shall be made where possible. However, there may be constraints such as drainage that make the installation of a leveling pad at a given location unfeasible.

The TSI shall be responsible for having access to equipment that can overcome the undulation of side slopes and other constraints at locations where leveling pads are not constructed.

The TSI shall ensure that all field staff assigned to any vehicle requiring a special operator's license have the appropriate training and certifications necessary to operate these vehicles.

The TSI shall display their company logo and relevant information on maintenance vehicles assigned to CTRMA support and any vehicle otherwise supporting work at, in route to, and around CTRMA sites, such that they are easily identifiable.

The TSI shall pay tolls for any TSI-operated vehicles traveling on the CTRMA facilities.

2.14.6 Maintenance Methodology and Procedures

This section provides information on the Scope of Work regarding maintenance methodology and procedures.

2.14.6.1 Corrective Maintenance

The TSI shall perform maintenance activities on a priority basis to detect, isolate, and rectify a fault or substantial degradation in the functionality of a system to restore it to its normal operable state. The TSI shall also perform the corrective maintenance based on the third-party audit results or corrective maintenance identified from the Monthly Maintenance Report (MMR).

The TSI shall provide corrective maintenance support on a 24-hour, seven (7) days a week, 365 days per year basis.

The TSI shall prioritize all ETCS maintenance events based on the potential impact on ETCS performance, operations, and the ability to collect revenue.

2.14.6.2 Preventative Maintenance

The TSI shall perform preventive maintenance activities on a scheduled basis (e.g., daily, weekly, monthly, quarterly, and annually) to ensure the maintenance of the ETCS meets the project performance and availability metrics by inspecting, adjusting, cleaning, tuning, and maintaining the ETCS components (e.g., hardware and software) to aid in preventing future failures.

As part of the Maintenance Plan and on an on-going basis, the TSI shall develop a preventive maintenance schedule to be approved by CTRMA, which represents the levels of effort, activities, resources, and schedules required to fulfill the TSI's preventive maintenance responsibilities.

The TSI shall continually evaluate the preventive maintenance schedule based on operational experience gained during the contract, consult routinely with CTRMA with reporting and regular meetings, and submit any recommended changes to CTRMA for approval. CTRMA may request a revised preventive maintenance schedule to ensure that the ETCS components continue to function correctly. The TSI shall schedule the work, as to not interfere with peak travel times.

The TSI shall enter proposed routine and preventive maintenance work activities in MOMS, which shall automatically generate alert/alarm messages and work orders tracked by MOMS.

CTRMA shall preapprove any preventive maintenance that impacts ETCS functionality or CTRMA's customers.

2.14.6.3 Warranty Maintenance

The TSI shall use MOMS to maintain warranty information (e.g., start date, duration, expiration date, responsibilities, and obligations of the parties). MOMS shall generate automated messages when warranties are nearing expiration or when maintenance service relates to a condition of a warranty remaining in effect.

2.14.7 Help Desk

The TSI shall provide help desk staffing during the hours of 7 am to 7 pm, Monday through Friday. The TSI shall provide an after-hours on-call telephone number and email address support for the resolution of issues noted by the CTRMA staff. The help desk shall act as a central point of contact for all technical support, including hardware and software support, installation of updated versions of software, networking, network connection requests, and troubleshooting. The TSI shall provide the ticketing system with appropriate user access for the help desk to log the trouble tickets. All tickets shall be tracked in the ticketing system until resolution.

2.14.8 Spares and Asset Management

The TSI shall purchase and maintain the spare parts and consumables inventory. The TSI shall provide the initial spare parts inventory for the project(s) used during the maintenance phase. This spare inventory shall include spares for new equipment procured by the TSI and spare inventory transferred from ETCS spare inventory. All items in the spare inventory shall have unit prices provided in Appendix 6, Price Proposal Forms, even if the TSI does not need to procure items for the initial spare inventory. If the TSI elects to use the initial spares inventory during warranty, the TSI shall be responsible for funding the replenishment of the inventory levels to their original quantities until the completion of the warranty phase at no additional cost to CTRMA. All spare parts purchased for the project during the maintenance phase (but not including warranty phase) shall be procured by the TSI and expensed on the monthly maintenance invoice. The TSI shall obtain CTRMA's approval before purchasing the needed spares. All spares procured shall become the property of CTRMA and shall be labeled as the CTRMA property and identified with a bar code or other inventory management process approved by CTRMA. The TSI shall use the CTRMA equipment nomenclature when entering spare part information into the spares tracking system(s).

The TSI shall perform a full physical inventory audit annually with a CTRMA representative to verify consistency between the MOMS Inventory Management subsystem and the actual count. The TSI shall also perform a cycle count on each bin or location at least two (2) times per year. MOMS shall have the capability to record the physical inventory, cyclic count details, and update the inventory accordingly with the reason for the difference found in the physical

inventory count. The TSI shall provide a check on all UPS batteries before the start of the project and provide this information within their Inventory Management subsystem.

The TSI shall maintain accurate records of all equipment and parts by location as they enter and leave inventory. The TSI shall apply a unique bar code on all equipment. The TSI shall place the bar code in a readily accessible and uniform area for all similar equipment. The TSI shall provide barcode scanners (three at a minimum) for use by maintenance personnel for direct entry into MOMS of all assets (e.g., operational units, spare inventory, and test equipment). Records shall include part numbers, part descriptions, serial numbers, times and dates of changes to location, warranty information, the CTRMA nomenclature (which includes the CTRMA asset tags associated with the equipment), and a brief description of the part itself. The TSI shall adhere to the following procedures during maintenance activities:

1. When a part requires replacement and is within its warranty period, the TSI shall return the part to the manufacturer
2. When a part requires replacement and is not within its warranty period, the part shall be repaired or replaced (whichever is most cost-effective) and returned to inventory
3. When a part is not repairable or not serviceable, MOMS shall record the part in inventory as retired. The TSI shall coordinate the disposition of retired parts with CTRMA

The TSI shall be responsible for the proper disposal of any parts and equipment removed from service per the CTRMA requirements. The TSI shall obtain approval from CTRMA before the disposal of any parts or equipment owned by CTRMA. The TSI shall coordinate and document any equipment disposals with CTRMA.

CTRMA reserves the right to independently purchase spare parts and transfer to the TSI subject to TSI's inspection and acceptance of the spare parts.

All equipment included in the asset management system shall use CTRMA's nomenclature, provided in Appendix 16, Existing Conditions Report.

2.14.8.1 Spare Hardware

Refer to Appendix 9, Equipment List, for a detailed table that encompasses all existing spares available to the TSI.

Regardless if the TSI elects to re-use any of the existing ETCS equipment, the TSI shall be required to accept all spare equipment owned by CTRMA and residing in the CTRMA warehouse facilities. All the existing and unused ETCS equipment shall be added to the TSI inventory.

CTRMA shall facilitate the transfer of reused equipment with the TSI and supervise the transfer of ownership lists and documents to ensure the transfer of ownership to the TSI. All equipment not being reused shall be subject to the guidelines outlined by the CTRMA equipment disposal policy.

The TSI shall maintain a spare parts/component inventory and adjust stock levels to the most cost-effective, efficient levels. The maintenance force shall keep all parts and components in a

fully serviceable condition ready for immediate installation. The TSI shall thoroughly test spare parts and store them in a serviceable condition to support rapid response time.

The TSI shall use MOMS for inventory control and parts listing.

2.14.9 As-Built Drawings

The TSI shall provide one (1) complete electronic set of as-built drawings for the ETCS in any “native” file format such as MicroStation, Visio, Excel, and one (1) complete electronic set in a PDF format on read-only electronic media.

CTRMA shall review and approve the format of the as-built drawings to ensure they include the required level of detail. The as-built drawing sets shall include the ETCS architecture, all schematics, logic diagrams, layouts, wiring diagrams, assembly drawings, parts detail drawings, and installation drawings. The set of as-built drawings shall consist of a title sheet, an index sheet, and the various as-built drawings. The index sheets shall include a listing of all drawings with headings for Drawing Number, Drawing Title, and the type of drawings, such as assembly, schematic, material list, wiring diagram, wire list, or similar categories.

The TSI shall incorporate and re-submit the as-built drawings for any design modifications, change orders, and field installation changes that occur during the project. CTRMA shall review the as-built drawings for content and shall accept the drawings only when the TSI has complied with the requirements set forth herein.

The TSI shall maintain updated versions of all previously delivered as-built drawing and submit updated as-builts to CTRMA annually, at a minimum, for CTRMA review and approval.

In addition to as-built document submissions and updates reflecting changes made for individual Work Authorizations or change orders, the TSI is responsible to always update and maintain current versions of as-built drawings.

This includes changes made because of routine maintenance or any other field modifications that may occur at any time during the entire warranty and maintenance period.

All as-built drawings shall have received approval before the beginning of OAT. If at any time during the operations of the ETCS, the physical construction or installation becomes modified for any reason, the TSI shall submit updated as-built drawings within two (2) months of completion of the modification. CTRMA shall approve the completion of physical construction or installation on a per facility basis. The TSI shall provide as-built drawings two (2) months after completion of the physical construction and installation at those facilities. CTRMA’s approval of the final system acceptance is a precondition to payment of the OAT completion milestone.

2.14.10 Safety Plan

The TSI shall develop a comprehensive Safety Plan for the project, submitted to CTRMA for review, comment, and approval per Appendix 13, Project Deliverable Schedule. The Safety Plan shall describe the procedures instituted both during system implementation/deployment and during system maintenance activities to ensure personal safety and compliance with all applicable state and federal laws, rules and regulations, and legislation including but not limited

to OSHA, NECA, FHWA, TxDOT, and the MUTCD. The Safety Plan shall also describe steps the TSI takes to ensure health and safety in situations of future pandemics.

The TSI shall ensure the training of personnel working within the facility work areas on the safety program. This training shall occur before the personnel enters any work area. The TSI is responsible for the safety of the TSI's personnel.

The TSI shall update the Safety Plan yearly as part of the Maintenance Plan.

2.14.11 Traffic Control Plan

The Traffic Control Plan shall describe any/all traffic control procedures that shall be instituted both during system implementation/deployment and during system maintenance activities to ensure traffic safety and continued efficient traffic flow. The Traffic Control Plan shall adhere to the traffic control requirements by all local, state, and federal agencies. Any vendor providing traffic control shall be certified and licensed to operate in Texas.

The TSI shall ensure the following, at a minimum:

1. All personnel working within the facility work areas have received training on the Traffic Control Plan
2. The TSI shall update the Traffic Control Plan yearly as part of the Maintenance Plan

The TSI shall implement and maintain the traffic control and sequencing plans throughout the installation, including adjustments to the traffic control and sequencing plans as necessary to assure the safe movement of traffic and pedestrians through the work zone. CTRMA is sensitive to the MOT during peak periods. The TSI will utilize CTRMA's lane closure process.

The TSI shall address all lane-closing procedures in the Maintenance Plan. All closures must be coordinated with CTRMA and CTRMA's operations and maintenance staff so that timely public notification can be achieved. The TSI shall immediately respond to CTRMA for emergency maintenance lane closures, as determined by CTRMA.

The TSI shall provide electronic portable changeable message signs, per TMUTCD and at CTRMA's request of TxDOT Special Specification 6001, as part of the traffic control operations, if addressed in the procedures in the Maintenance Plan. One truck-mounted attenuator is required for all single and double lane closures. Multiple truck-mounted attenuators are required for complete road closures. Truck-mounted attenuators shall be required according to TMUTCD.

2.14.11.1 *Maintenance of Traffic During Installation*

Before any installation, the TSI shall prepare traffic control and sequencing plans for the installation activities being performed. The traffic control and sequencing plans prepared by the TSI must be reviewed and approved by CTRMA before the commencement of any installation.

The TSI shall provide a full-time Traffic Control Coordinator throughout the installation and testing phase of the work. The Traffic Control Coordinator must cooperate with CTRMA and CTRMA's roadway contractor. Revisions to the Traffic Control Plan during implementation must

be developed by the TSI in coordination with the CTRMA Construction Engineer and reviewed and approved by CTRMA.

The TSI shall provide CTRMA with the name of the Traffic Control Coordinator along with a 24-hour phone number where the traffic control coordinator can always be reached.

2.14.11.2 Maintenance of Traffic During Maintenance

Closures for routine maintenance require 72-hour advanced notification and shall be scheduled during minimal traffic periods and coordinated with CTRMA to mitigate interference with the traveling public.

The TSI shall ensure a full-time, off-duty uniformed, certified law enforcement officer(s) in an officially marked vehicle for each lane closure is part of the traffic control operations. Officers must be able to show proof of certification by the Texas Commission on Law Enforcement Officers Standards.

Patrol vehicles must be marked to correspond with the officer's agency and equipped with appropriate lights to identify them as law enforcement. For patrol vehicles not owned by a law enforcement agency, markings shall be retroreflective and legible from 100 feet from both sides and the rear of the vehicle. Lights shall be high intensity and visible from all angles.

2.14.12 Security Plan

The TSI shall provide a Security Plan for the project, submitted to CTRMA for review, comment, and approval. The Security Plan shall describe the general approach the TSI will implement to address security. TSI shall work with CTRMA to determine a data classification process for system data. The Security Plan shall describe personnel, facilities, data, and communications security provisions used for the project(s), including the following, at a minimum:

1. Cabinet, hub, facility, and housing access
2. ETCS software control, including User ID and password protections and system authorization and access control
3. Data privacy
4. Data Confidentiality
5. Data Integrity
6. Data Availability
7. Data communications security
8. Malware and intrusion detection/prevention
9. Incident response
10. Security Awareness Training
11. Responsibilities, rights, and duties of personnel and system users
12. Audit and compliance reporting
13. Tools and processes to be used
14. All applicable SOC security requirements including quarterly user reviews

The TSI shall agree to comply with the Security Plan and applicable policies for the duration of the contract once CTRMA approves the plan.

2.14.13 Change Control

CTRMA's change control process is for any CTRMA system/network changes, which is defined as needed software or hardware updates to the ETCS, and all TSI managed subsystems and communication networks. The change control process does not apply to regular roadside maintenance, where items are being updated/replaced in kind. The change control process shall be managed by the TSI with review and approvals from CTRMA to evaluate Change Request Forms (CRFs) submitted to perform work on CTRMA's ETCS and network. The CRF template shall be developed and managed by the TSI, including an initial review with CTRMA for approval to ensure all key elements of the change control management and decision process are captured as part of the change control process.

The purpose of the change control process is to communicate, vet, and schedule CTRMA system/network changes that could affect the tolling system and the system end-users, including both the internal CTRMA users and toll road customers. The TSI should anticipate CTRMA may require further discussion and consideration of more complex, high risk, and costly change requests. The TSI shall also include the various CTRMA stakeholders from one or several departments such as Finance, Legal, Communications, Operations, Maintenance, and Senior Management. Change requests resulting in additional expenses to CTRMA beyond the base contract amounts may require the CTRMA board approval determined by their dollar value and potential customer or operational impacts. CRF forms for maintenance proposed by the TSI are due the week prior.

Significant proposed changes should be coordinated with the respective impacted SME's before submission of the formal paperwork. The approval of the CRF is meant to be the final check in the process to ensure that the CTRMA operations staff are not impacted unexpectedly. The TSI shall include of summary of all upcoming, approved, and completed change requests with the monthly maintenance report.

2.15 MAINTENANCE ONLINE MANAGEMENT SYSTEM (MOMS)

The TSI shall provide an automated standalone MOMS application that allows for monitoring roadside and TFH equipment, tracking and reporting of work orders, alarm messages, equipment inventory, and equipment health. MOMS shall have the ability to support configurable alarm priorities, as well as maintenance personnel tracking, paging, and work assignments. MOMS shall provide the following, at a minimum:

1. Reporting and tracking alarm/alert messages
2. Notifications to the TSI and the CTRMA staff
3. Logging acknowledgments
4. Generate and track work orders
5. Maintain preventive maintenance schedules
6. Generate repair histories
7. Generate trend analysis
8. Maintain parts inventory

9. ETCS asset management
10. Track system availability
11. Rapid detection of poor performing cameras
12. Lifecycle management and warranty management, including end of warranty dates

MOMS shall function as an integral part of all maintenance activities, including routine preventive, warranty, and corrective maintenance.

2.15.1 MOMS General Technical Requirements

Table 2-54: MOMS General Technical Requirements

ID	RULE
REQ-329	MOMS shall monitor and collect data on the ETCS and equipment status continually 24 hours a day, seven (7) days a week.
REQ-330	MOMS shall support the assignment of maintenance priority levels based on severity level, facility, day, and time.
REQ-331	MOMS shall track Mean Time Between Failures (MTBF) for all ETCS elements.
REQ-332	MOMS shall provide current toll point operational status.
REQ-333	MOMS shall provide current TFH operational status.
REQ-334	MOMS shall provide failure, malfunction, or degradation information by location (e.g., facility and plaza).
REQ-335	MOMS shall provide a general description of the failure, malfunction, or degradation.
REQ-336	MOMS shall support automated spare parts, inventory entry, tracking (usage and reorder points), and control.
REQ-337	MOMS shall provide detailed part and equipment descriptions (e.g., part/model number, serial number, asset tag number, vendor contact information, and the dates the user entered this information into MOMS).
REQ-338	MOMS shall provide part and equipment maintenance activity and repair histories.
REQ-339	MOMS shall automatically generate and track work orders for preventive maintenance, corrective maintenance, and emergency maintenance.
REQ-340	MOMS shall provide historical subsystems, equipment, and component performance information (e.g., availability, mean time between failure, average response time, average restore time, and percent of actual inventory levels to recommended inventory levels for items).
REQ-341	MOMS shall exist as the repository for work orders and logging of maintenance activities initiated without a work order.
REQ-342	MOMS shall support access to stored data using a query by toll zone, hub, or an off-site location, work order status, component, or unique work order number.

ID	RULE
REQ-343	Work order entries shall contain the following types of information, recorded using standardized terminology, and codes where possible: <ol style="list-style-type: none"> 1. Unique work order number 2. Response and restore time, date, location code 3. Model and serial/part number of equipment or software version 4. Status updates with time, date, location, component, and activity records 5. Error and event codes associated with the incident or failure event 6. Description of work performed (e.g., corrective actions, reconfiguration) and services rendered (e.g., warranty service) 7. Name of the maintenance technician(s) who performed the work 8. Disposition of the hardware and equipment problem (e.g., repaired, replaced, or returned to supplier/manufacturer) 9. Work order closure pending specific follow-up actions (e.g., root cause analysis)
REQ-344	MOMS shall track hardware, equipment components, software failures, and malfunctions by equipment type and ID number. MOMS shall track component failure rates (e.g., failures/operating hours) or MTBF continuously.
REQ-345	MOMS shall generate monthly reports showing measured average failure rates and manufacturer advertised or claimed MTBF (as applicable).
REQ-346	Access to MOMS information shall require the entry of the user’s identification and password from which the subsystem shall retrieve the user’s assigned role(s).
REQ-347	User sign-on, access, and access failures, both local and remote, to any element of the toll systems shall be recorded and tracked for security audit purposes and reported to MOMS. The system shall continuously and automatically monitor for unauthorized access; access violations shall be reported to MOMS as a Priority 1 alert. These reports shall be provided to CTRMA within one (1) hour of discovery.
REQ-348	MOMS shall not allow any user to append the timestamp of an event, including the initial acknowledgment time, response time, and repair times entered by a maintenance staff member without express permission by CTRMA.
REQ-349	If CTRMA provides permission, the appending of the timestamp of an event must include the following: <ol style="list-style-type: none"> 1. Who performed the update 2. When the update occurred 3. What information was updated 4. Why the update was needed

2.15.2 Equipment Status Monitoring and Diagnostics

Table 2-55: Equipment Status Monitoring Technical Requirements

ID	RULE
REQ-350	MOMS shall report the status and diagnostic results of all equipment in near real-time.
REQ-351	Performance monitoring functionality shall allow the user to select and observe the status and performance of several pre-defined portions of the system.
REQ-352	MOMS shall contain the functionality to generate alerts, alarms, and notifications, as well as the ability to send this information to a configurable group of recipients.

ID	RULE
REQ-353	Data from the alerts, logs, hardware and software status, work orders, tickets, and any items in the IT Service Management/MOMS shall not be deleted or modified at any time.
REQ-354	A Single Network Management Protocol shall support the monitored equipment. The TSI shall build routines to measure instances of an undesirable state and generate an alarm when an established and configurable threshold is reached.
REQ-355	MOMS shall be capable of identifying state changes requiring the automatic generation of work orders and shall dispatch a technician on a schedule consistent with the severity of the state change and the assigned priority level.

2.15.3 Work Order Generation

Table 2-56: Work Order Generation Technical Requirements

ID	RULE
REQ-356	MOMS shall automate the process of expediting repair/service calls to field maintenance staff. MOMS shall contain the functionality to generate work orders with little or no human intervention.
REQ-357	The TSI staff shall have the ability to create work orders manually, enter data regarding maintenance statuses, search work orders based on component or subsystem failures, and close work orders.
REQ-358	<p>Work order generation shall include the following:</p> <ol style="list-style-type: none"> 1. Generate a minimum of three different work order priorities as defined by CTRMA. 2. Capability to build ad-hoc work orders for unusual system occurrences. 3. Provide formats and specifications as determined by CTRMA. Work orders shall include the following information regardless of the final format: <ol style="list-style-type: none"> a. The date and time of the work order generation b. The date, time, and location of the repair or maintenance call c. The work order number (sequential) d. A description of the failure or malfunction 4. MOMS shall contain a work order field for failure or malfunction descriptions. 5. MOMS shall provide a drop-down field for standardized descriptions (approved by CTRMA) for the field designated failure or malfunction descriptions. This drop-down field shall contain searchable functionality. 6. MOMS shall allow the user to schedule one-time or recurring preventive maintenance tasks for a specified duration(s).

2.15.4 Technician Dispatch

Table 2-57: Technician Dispatch Technical Requirements

ID	RULE
REQ-359	MOMS shall contain the functionality to automatically dispatch in real-time the required support personnel to restore a failed, malfunctioning, or degraded equipment or component item.
REQ-360	Depending on the severity of the problem or issue, MOMS shall assign a priority level. MOMS shall contain the functionality to include the corresponding priority level value to the work order record.

2.15.5 Work Order Tracking

Table 2-58: Work Order Tracking Technical Requirements

ID	RULE
REQ-361	MOMS shall provide the capability for tracking the status of the generated, processed, and closed work orders. This functionality shall be part of the MOMS dashboard or separate work order management functionality.
REQ-362	MOMS shall have the ability to determine and calculate initial acknowledgment times, response times (both remote and on-site), repair times, and lane and system downtime.
REQ-363	MOMS shall have the ability to search by and sort on corrective actions taken by the TSI staff to resolve the failure or malfunction.
REQ-364	The TSI shall not place any MOMS pages into a hold queue unless CTRMA approves, or lane closures are required to service the failed device.

2.15.6 Dispatch Escalation

Table 2-59: Dispatch Escalation Technical Requirements

ID	RULE
REQ-365	MOMS shall contain functionality to escalate a work order not acknowledged by the appropriate technician within a configurable time of the initial notification.
REQ-366	MOMS shall support building and reading an escalation order that uses a table containing the IDs of support staff and supervisors.
REQ-367	This escalation functionality shall occur should MOMS not receive a notification response for any event.

2.15.7 Information Entry and Closeout

Table 2-60: Information Entry and Closeout Technical Requirements

ID	RULE
REQ-368	MOMS shall support the functionality for a technician to enter their actual arrival time and time of work completion.
REQ-369	MOMS shall support the functionality for a technician to enter this information at the site of the maintenance issue, or remotely.

ID	RULE
REQ-370	After the technician performs the work, MOMS shall update the status of the work order along with information entered by the technician describing the event, work performed, and materials used.
REQ-371	The work order generation functionality shall integrate with the spare parts inventory control functionality. MOMS shall automatically update the spare parts inventory based on the technician’s entry of asset coded parts used to restore defective items.
REQ-372	MOMS shall allow the assigned and responding technician to close out the work order when the subsystem receives a status change. This status change shall indicate the restoring of the defective item.

2.15.8 Scheduled Services (Manufacturer’s Warranties)

Table 2-61: Scheduled Services (Manufacturer’s Warranties) Technical Requirements

ID	RULE
REQ-373	MOMS shall use and adhere to manufacturers’ required maintenance activities and intervals to comply with warranty maintenance requirements so that manufacturer warranties remain valid.
REQ-374	MOMS shall issue an alert at a configurable number of days before the expiration of any warranty period entered.

2.15.9 Spare Parts Inventory Control System

Table 2-62: Spare Parts Inventory Control System Technical Requirements

ID	RULE
REQ-375	MOMS shall include an automated spare parts inventory control system for entering, tracking, and controlling the movement of spare parts used to maintain the ETCS.
REQ-376	The MOMS GUI shall support the entry of each equipment item, device, part, and component.
REQ-377	Entered information shall include part/model number, serial number, primary vendor contact information, subcontracted vendor contact information, last invoice price for the item, last order lead time (e.g., order to delivery), and the date the user entered the information into the system.
REQ-378	The management of spare parts inventory within MOMS shall integrate with the work order process to track the usage of spare parts.
REQ-379	The MOMS Inventory Management subsystem shall work in conjunction with the GUI entries to remove spare parts from inventory.
REQ-380	MOMS shall contain the functionality to calculate and track the current value of the spare parts inventory.
REQ-381	MOMS shall record and track all repair activities, and the details of the repair and the disposition of the part, including parts retired.
REQ-382	The TSI shall provide a safe and secure storage location for all spares and shall bear all risk for loss or damage.
REQ-383	MOMS shall have the option to move or transfer asset items between locations and the TSI maintenance staff.

ID	RULE
REQ-384	MOMS shall track the complete chain of custody for each inventory item from initial purchase to storage at the TSI facility, to dispensing inventory to staff, to installation in the field, operation, removal, and final disposal.
REQ-385	The MOMS Inventory Management subsystem shall automatically generate alerts when asset inventory reaches a configurable threshold.
REQ-386	MOMS shall contain the functionality to collect and analyze the ETCS component usage data to generate forecasted parts and replacement cycles, as well as forecasted purchases for the succeeding eighteen (18) months. MOMS shall also contain functionality to maintain vendor lists for any of the ETCS assets.

2.15.10 MOMS Reporting

Table 2-63: MOMS Reporting Technical Requirements

ID	RULE
REQ-387	MOMS reporting system shall support the generation of reports in PDF, CSV, and other formats specified.
REQ-388	MOMS shall provide CTRMA read-only access to this subsystem to perform such functions as generating reports, reviewing details of open work orders, investigating current hardware, equipment, and device locations, and reviewing spare parts inventory levels.

2.16 TRAFFIC MANAGEMENT CENTER STAFFING

As part of CTRMA’s long term operations and staffing strategy, CTRMA is considering hiring all or some required TIM Center staff and assuming all full or partial responsibility for TIM Center staffing and operations. A final decision requires CTRMA’s board approval and is not expected to take place until mid-2022, with a transition from the TSI to the CTRMA staff to occur in mid-2023.

Until CTRMA reaches a decision resulting in CTRMA assuming TIM Center staffing responsibilities, the TSI is responsible for all TIM Center staffing needs.

The TSI shall employ, train, supervise, and schedule the required staff to support CTRMA’s TIM Center operations, including, but not limited to, the following duties:

1. Provide coordinated monitoring of incidents with CTRMA and partner agencies.
2. Answer phone inquiries and coordinate incident-related activities with partner agencies to share information related to traffic conditions.
3. Provide monitoring of all equipment and systems, including the TSI-provided ELCC, required to support the express lanes and dynamic pricing system, including traffic control device operation and variable message signs.
4. Operate CTRMA’s third-party Advanced Traffic Management System (ATMS) software interface to field devices and equipment from the TIM Center for traffic management.
5. Create and post messages for the Dynamic Message Signs (DMS).
6. View traffic conditions on Closed Circuit Television (CCTV).

7. Monitor traffic status, special events, scheduled events, active events, and incident fault status by utilizing CCTV cameras, emergency response, law enforcement reports, and internal systems.
8. Communicate with emergency services such as state and local police, emergency communications centers, emergency response/motorist assist, maintenance departments, and media outlets.
9. Facilitate incident management, which includes detection, verification, response, and clearance.
10. Dispatch emergency response personnel in response to incidents.
11. Monitor all active traffic events that occur during the shift and ensure that the information is accurately recorded into systems and traffic-related messages.
12. Troubleshoot and resolve system-related problems.
13. Coordinate with another TSI and the CTRMA staff with regards to various agencies and general control room coordination, especially at shift change.
14. Assist with the data collection for various reports, travel speed and travel time reports, incident reports, field equipment failures, and any other reports that are required for the operation of the TIM Center.
15. Perform related duties as directed by the CTRMA Traffic and Incident Manager.
16. Provide adequate staff and resources for all tasks and activities throughout the duration of the contract, including planned and unplanned staff absences, emergencies, storms and other significant events.
17. Employ, train, supervise, and schedule ELCC operators. These activities shall include accommodating vacations, sick leave, and other absences of personnel by providing adequate training and supervision of relief operators and on-call personnel.
18. Issue work orders for equipment repair and help establish priorities for the repair of failed equipment.
19. Attend regular meetings with CTRMA to cooperatively identify and prioritize work to be performed.
20. Maintain records and documentation as directed to support the overall operations of the TIM Center and provide data for documenting performance measures and progress.
21. Participate in post-incident debriefings with all appropriate agencies involved in managing major traffic incidents to determine whether existing operating procedures should be changed. The TSI personnel assigned to this task shall be available to respond to electronic notifications within one hour during off-duty hours to help as appropriate.
22. Prepare and submit monthly invoices and progress reports per the applicable CTRMA requirements. Clerical/Administrative support staff will prepare the TSI invoices, reports, forms, letters, and any other official project-related correspondences, as well as the hiring of staff and or other personnel-related duties. The Clerical/ Administrative support staff are not expected to have TIM Center-related activities as a full-time task, nor are they to be based at the TIM Center.
23. The TSI shall provide staffing during peak periods, on holiday weekends, special events, and/or emergency conditions where CTRMA may require greater levels of staffing. If

CTRMA deems additional TSI personnel are necessary to operate the expanded functions of the MoPac project, the TSI shall supply extra staff for the short-term, provided a minimum of four-hour notice is given.

24. In no event shall the TSI operator leave the TIM Center unstaffed during an emergency, active event, or incident, even at the end of a shift. If CTRMA determines the additional TIM Center staff shall be a permanent position requirement, the staffing level shall be adjusted via supplemental agreement. Additional pricing estimates shall be provided upon request.
25. The TSI shall provide staffing to operate the TIM Center during peak hours and in operation from 5:30 am to 8:00 pm Central Standard Time (CST), five days a week excluding holidays per CTRMA's approved holiday schedule.

2.17 NETWORK ADMINISTRATION

The CTRMA Fiber Optic Networks (FON) at each facility are private telecommunication network infrastructures. There are two typical configurations currently in use. One consists of Gigabit and Fast Ethernet equipment operating in a ring and a point-to-point (P2P) configuration over a CTRMA-owned fiber optic cable plant. The other configuration consists of a Gigabit Fiber network operating along a single path. Network infrastructure and configurations for each facility are similar but not identical. Diagrams and as-builts for each of the existing facilities are available to bidders through the ETCS video recording and the Appendix 16, Existing Conditions Report.

The FON serves CTRMA's immediate and long-term telecommunications needs for data and video transmission, supporting present and the future ETCS and ITS. The FON provides for all CTRMA's data communication needs concerning the operation of the Legacy ETCS.

The FON is composed of two distinct elements. The first element is the fiber optic cable and conduit plant, referred to as FON outside plant (OSP). The second element is the networking hardware, referred to as FON inside plant (ISP). The FON OSP includes, without limitation, buried single-mode fiber cable installed in the HDPE conduit. For each existing facility, the FON OSP provides a single ring network backbone. The FON ISP includes, without limitation, Layer 3 Gigabit Ethernet Core switches, Layer 3 Gigabit Ethernet Aggregation switches, Layer 3 Gigabit Ethernet Edge switches, Layer 2 Gigabit Ethernet Edge switches, channel banks, and firewalls. Each facility has a Wrong Way Detection (WWD) system, which, in some instances, may interconnect with the toll system at the layer 3 switch level. The TSI will not be responsible for the WWD system communications.

For each new facility, the TSI is responsible for the installations of all necessary communication equipment, connections, configurations, testing, monitoring, and network administration as it relates to the LAN and WAN. The TSI shall develop network designs in coordination with CTRMA and the civil contractor.

For the transition of existing facilities, the TSI is responsible for all communications equipment, connections, configurations, testing, monitoring, and network administration as it relates to the LAN and WAN necessary to support the transitioned ETCS. The TSI may reuse existing

equipment or install new equipment, as necessary. The TSI shall coordinate the transition of network administration and maintenance responsibilities with the existing TSI and CTRMA as part of the transition of the entire facility, which shall include identification of demarcation points where possible.

All work performed by the TSI shall conform to the latest edition of all codes, standards, and specifications listed below:

1. American National Standards Institute (ANSI)
2. American Society for Testing and Materials (ASTM)
3. Building Officials and Code Administrators, Inc. (BOCA)
4. Computer and Business Equipment Manufacturers Association (CBEMA)
5. Electrical Testing Laboratories (ETL)
6. Illuminating Engineers Society (IES)
7. Institute of Electrical and Electronics Engineers (IEEE)
8. Insulated Cable Engineers Association (ICEA)
9. National Fire Protection Association (NFPA)
10. National Electrical Safety Code (ANSI/IEEE C2)
11. National Electrical Manufacturers Association (NEMA)
12. Underwriters Laboratories, Inc. (UL)
13. National Electrical Contractors Associations (NECA) - National Electrical Installation Standards (NEIS)
14. Electronic Industries Association (EIA) Standards for Interfaces and Interconnection or Electronics
15. Building Industry Consulting Service International (BICSI) Telecommunications Distribution Methods Manual
16. Telecommunications Industry Association (TIA)
17. Organization for the Advancement of Structured Information Standards (OASIS)

The civil contractor will provide, terminate, and test the fiber connections from each toll equipment location (the Metro Area Network or MAN). The TSI is responsible for all elements of the LAN. The TSI is responsible for all internet circuits connecting the toll system network(s) to the internet cloud.

The TSI shall coordinate with CTRMA and the civil contractor regarding demarcation points between the onsite fiber network and Internet Service Providers (ISPs). The TSI shall coordinate with CTRMA and the civil contractor regarding overall network design and splicing for the MAN physical network between the toll locations. Once network design is finalized, the TSI shall certify in writing that the network design meets all contract performance requirements.

The TSI shall be responsible for the maintenance of the entire CTRMA communications network installed on the project(s). Network maintenance activities shall include the monitoring of the primary and backup networks transmitting data between the roadside equipment, the Facility Host location(s), and the CTRMA BOS. The TSI shall monitor the connections with all external interfaces at the TOC(s) and Facility Host, such as to the BOS and commercial leased lines.

The TSI shall be responsible for the protection of the FON outside plant (OSP) including utility locate services and utility coordination with internal and external stakeholders. TSI must comply with applicable laws, all federal, state, and local laws, statutes, ordinances, codes, rules, regulations, guidelines, and industry practices and methods including locating procedures adopted and approved by the National Utility Locating Contractor’s Association (NUCLA) and the State of Texas and include necessary records to research and respond to field investigations to determine the facilities’ locations.

The TSI will coordinate with CTRMA for the development, implementation, and administration of warranty/service support contracts with network equipment manufacturers for all network hardware. Support contracts shall provide for repair/replacement of the CTRMA identified “critical” components within 24 hours of equipment failure.

The TSI shall maintain warranty records and service agreements for all network hardware.

Table 2-64: Network Administration Technical Requirements

ID	RULE
REQ-389	The TSI shall design, integrate, purchase new or re-use current equipment, furnish and install all network elements attached to the toll system side of each network demarcation point needed to protect, operate and maintain the toll system in accordance with the requirements of this contract. All such network elements shall be part of the Toll System.
REQ-390	The TSI shall not furnish any item that has been previously used for development work, a part of a previously purchased system, or any items that have been salvaged or rebuilt.
REQ-391	The TSI will provide warranty and service support contract for all existing network equipment that will be re-used for the term of the contract. Any network equipment which reaches “End of Life” and is no longer supported by the manufacturer will be replaced at the TSI’s cost.
REQ-392	All new network equipment and related operating systems shall be supported with patches, hotfixes, and updates from the manufacturer for a minimum of ten (10) years after installation.
REQ-393	The TSI shall implement the toll system network(s) using industry-standard best practices for securing all interfaces and communications between network elements, including but not limited to multi-factor authentication, virtual private networks, strong passwords, encryption, and intrusion detection/prevention.
REQ-394	The toll system network(s) shall comply with industry-standard best practices for accessing the network(s) from remote locations, including but not limited to multi-factor authentication, virtual private networks, and strong encryption.
REQ-395	The toll system network(s) shall limit access to configurations, operations, and controls to authorized personnel. Multi-factor authentication methods shall control such access.
REQ-396	During design and construction, the TSI shall provide review and comment of civil contractor shop drawings or similar within the context of the toll system network(s) functional and performance requirements.

ID	RULE
REQ-397	Upon approval of shop drawings or similar design elements by the civil contractor within the context of system function and performance, the TSI shall assume responsibility for those elements. If the civil work is installed as designed and does not meet the performance requirements of this contract, the TSI shall be responsible for the costs of the redesign, civil rework, and additional equipment costs as further outlined in the contract.
REQ-398	The TSI shall review and provide comments on all aspects of plaza design drawings submitted by the civil contractor that is related to the toll system network(s) equipment required to meet the requirements of this contract.
REQ-399	All interfaces that utilize the Internet for communication shall implement a firewall for added security. The firewall configuration shall be submitted to CTRMA for review and approval prior to implementation.
REQ-400	All applicable toll system elements shall be Federal Communication Commission (FCC) licensed and approved.
REQ-401	All elements of the toll system shall not be susceptible to electromagnetic emissions from other equipment operated at department facilities, including but not limited to police two-way radios, citizens' band radios, other radio systems allowed or licensed by the FCC, mobile telephones, security Equipment, roadside lighting, and other electrically powered items.
REQ-402	The TSI shall enter or update all details of each network equipment element into MOMS immediately after installing such an element.
REQ-403	If communications to any of the ETCS are down, an alarm shall be generated and reported to MOMS.
REQ-404	The TSI shall provide an industry-standard network monitoring tool such as SolarWinds to monitor all network equipment actively and provide notification of any network issues. This monitoring tool shall be separate from MOMS but shall interact with MOMS such that MOMS creates and maintains trouble ticket/problem resolutions for the system.
REQ-405	Prior to installing each unit of network equipment, the TSI shall apply all updates, patches, and firmware changes provided by the manufacturer. Critical updates will be tested and installed within thirty (30) days of release. All applicable updates will be reviewed to determine if they are necessary and, if so, will be tested and installed within ninety (90) days of release.
REQ-406	Remote access to all systems shall be VPN based and controlled through an industry-standard Identification and Access Management (IAM) system to ensure the systems meet all state and the CTRMA information security guidelines, with each user having a unique log-in and requiring multi-factor authentication (i.e., Access Control).
REQ-407	CTRMA envisions implementing various pilot programs for new transportation technologies as part of its toll road projects. For new toll facilities, and as part of the network design involved in refreshing the network equipment for current toll facilities, the TSI shall install adequate fiber, cabling, conduit, and bandwidth such that 25% can be reserved to be used by other technology vendors designated by CTRMA. The TSI shall be responsible for network administration of the entire network and will provide configuration and set up assistance to new technology vendors.

The following table defines cloud-based security, data management, and disaster recovery requirements only if the TSI implements a cloud-based infrastructure in support of the TFH or any TFH or ETCS subcomponents.

Table 2-65: Off-Premise (Cloud-based) Technical Requirements (if applicable)

ID	RULE
REQ-408	The physical location of all systems housing data related to the CTRMA ETCS shall be within the 48 contiguous US states and shall be in a Tier 2 or higher facility.
REQ-409	The TSI shall ensure that no PII or PCI related data is stored on storage devices shared with other cloud provider customers.
REQ-410	All purging of data shall be done through cryptographic erasure.
REQ-411	The TSI shall implement encryption of data at the roadside system level and ensure all data is encrypted prior to transit.
REQ-412	The TSI shall control all encryption keys. The cloud provider shall not control any data encryption keys.
REQ-413	Contracts, licensing, agreements, and the SLAs between the TSI and the cloud provider shall be provided to CTRMA for review.
REQ-414	The TSI shall insure through the contract, agreement, or licensing that all data within the TFH system is owned in totality by CTRMA, and the cloud provider shall provide access to the TFH systems and data at any time at CTRMA’s request. This access shall not require approval by the TSI. Alternatively, the TSI can provide admin access to the data storage.
REQ-415	The TSI shall insure through the contract, agreement, or licensing that all data will be accessible for export by the TSI or CTRMA on request. Alternatively, the TSI can provide admin access to the data storage.
REQ-416	The TSI shall provide an information security audit report for the cloud provider to CTRMA for review and approval prior to the TSI contracting with a public cloud provider.
REQ-417	REQ-417A: The TSI shall document their approach to disaster recovery, incident response, and business continuity related to the cloud-based services for CTRMA for review and approval. These concepts shall be addressed in the TSI’s Disaster Recovery and/or Security Plan as appropriate. REQ-418B: The TSI shall conduct a walk-thru test of the incident response process semi-annually and separately from any disaster recovery or business continuity testing.
REQ-418	The TSI shall address information security specific to security issues with the use of the cloud infrastructure within the TSI’s Security Plan.
REQ-419	If the TSI is implementing “on-demand self-service provisioning” for its cloud infrastructure, the TSI shall conduct a weekly audit of its cloud services to ensure no unauthorized usage of services has occurred.
REQ-420	At least one copy of all system and data backups shall not be stored within the same cloud provider region as the TFH itself.
REQ-421	All connections to the TFH and the cloud management controls and consoles, and user interfaces shall be made through secured connections using multi-factor authentication. IP Enabled lockdown shall be implemented where appropriate.

2.18 SUCCESSION PLANNING

The TSI shall be responsible for services in support of transitioning the responsibilities of the TSI under this contract to CTRMA and/or another entity whenever this contract terminates. The TSI shall be responsible for the following activities in support of succession:

1. The proposed approach to support the transition to a successor ETCS at the conclusion of the contract.
2. Update all ETCS documentation to include any previously undocumented changes, additions, alterations, and configurations for delivery to CTRMA and any succeeding entity, including the following:
 - a. Detailed Design Document
 - b. Detailed Reports Document
 - c. Business Rules
 - d. Data Dictionaries
 - e. As-Built Drawings
3. Provide all service contracts, agreements, licenses, manuals, Standard Operating Procedures, correspondence, outstanding invoices, manuals, and training materials to CTRMA and any succeeding entity
4. Provide equipment maintenance history
5. Provide spare parts inventory and history
6. Participate in meetings to plan for the transition of the data to another system
7. Participate in testing of migration procedures and applications
8. Provide any technical data requested by CTRMA or any succeeding entity

The TSI shall prepare and submit a Succession Plan to CTRMA. The Succession Plan shall include the following, at a minimum:

1. Provide information and a schedule for the transition of the system
2. Define the personnel, roles, and responsibilities to maintain and execute the plan
3. Define the processes, activities, and controls required
4. Provide for an orderly transition of all components comprising the TSI ETCS from the incumbent TSI to the incoming TSI
5. A list of the TSI maintained facilities including redundant power requirements, UPS configuration, generation, power lines and distribution, environmental control and monitoring systems, fire protection and access controls, rack layouts, wiring, and network
6. Details of the TSI-provided hardware, including open tickets related to incidents with any vendor, storage capacity (e.g., total, used, and available), performance metrics, and planned improvements. Also, the TSI shall provide a catalog of all documents, equipment, and technical data discussed in this section of the RFP, at a minimum.
7. A description of what procedures shall be necessary to prepare and transfer all data and documentation to CTRMA or a succeeding entity

8. A proposed schedule for the succession activities necessary for an efficient, accurate, and complete transition to a succeeding entity.

The Succession Plan shall support a 120-day succession period to transition operations from the incumbent TSI to the incoming TSI. During this 120-day period the TSI must provide continued Services and transition support to ensure that there is business continuity and no negative effects to customers and customer service during the transition.

The initial Succession Plan shall be submitted upon commencement of the maintenance phase with the transition of the first facility as defined in Phase I. The TSI shall update the Succession Plan with the transition of each additional facility and implementation of each new facility within ninety (90) days of the commencement of the maintenance phase for each subsequent Work Authorization. The updated Succession Plan shall address changes and/or new components implemented with each facility. In addition to updates associated with each Work Authorization, the TSI shall update the Succession Plan annually, to reflect any other changes resulting from maintenance, configuration, or upgrades that may impact any aspect of the Succession Plan. All updates to the Succession Plan shall be submitted to CTRMA for review and approval. The TSI shall be responsible for supporting the transition to the successor system, without additional cost, at the end of the contract.

2.19 MANUALS

The following sections provide information regarding reports and system user manuals.

2.19.1 Reports Manual

The TSI shall provide a Reports Manual that includes all available reports. The Reports Manual shall include the following, at a minimum:

1. Name of the report
2. Report description
3. Version number
4. Identification of report field level reconciliation (i.e., which fields in one report can be reconciled to another)
5. Data element dictionary that provides field definitions and defines each data element in the report to be updated and maintained by the TSI as reports may be modified over time. With any new release of a report, the corresponding data dictionary must be updated and provided for approval to CTRMA along with the report
6. Latest date of any revision
7. Sample report
8. SQL queries (or similar construct)

The reporting system shall generate, display, export, and store reports as per the following requirements:

1. Report generation screens shall be standardized such that layout, entry fields, buttons, search functionality, and similar features are the same across all reports.
2. Multiple tabs shall be avoided.
3. Date and time entry fields shall have a feature that allows for the quick entry of values appropriate and typical to the given report. For example, the date and time entry fields have a button or link that completes the From Date/Time entry fields from the beginning of the current day, and the To Date/Time entry fields with the end of the current day.
4. Standard reports shall be scheduled to be generated automatically on a user-defined frequency/time or by user demand.
5. User access to reports based on pre-defined, configurable user categories.
6. Summary and detail level reports shall allow the user to drill down from summarized data fields to obtain the detailed underlying data.
7. Standardized report format with headers and footers on all pages that contain the following:
 - a. CTRMA logo
 - b. Report title
 - c. Selection criteria used to generate the report
 - d. Date and time when the report was generated
 - e. Username
 - f. Indicator of whether the report contains adjustment data
 - g. Page number and the total number of pages contained in the report
 - h. Subtotals
 - i. Print sizes ranging from letter-size to tabloid-size paper
8. Column and row titles labeled using terms that are clearly defined in user documentation and applied consistently throughout all reports.
9. An unlimited number of columns to display the necessary data. Reports that are intended to be printed shall be approved by CTRMA for columns, look and feel.
10. Segregation of relevant data by facility/segment.
11. Selection of one or more specific facilities and segments.
12. Range of output options including PDF, CSV, Excel 2016 (or later), and screen display.
13. Full reconciliation, whereas detail level reports support summary level reports and data points (numbers) reconcile between them.
14. The transaction and revenue reports shall be available by the facility/segment.
15. All reports shall adhere to the report performance KPI's.

Hourly, daily, weekly, monthly, and yearly transaction and revenue shall be available by location (facility, plaza) and presented in row/column format as well as in graphical and/or chart format.

The TSI shall develop and submit a Reports User Manual for review, comment, and approval by CTRMA. This manual shall detail each report delivered to CTRMA, including report name, column headings, report parameters, and details for expected data in each column/row.

2.19.2 System User Manuals

The TSI shall provide a set of system user manuals designed to provide the intended users with the information necessary to perform their work as it relates to the proposed system. All manuals provide a logical system-oriented organization and content that incorporates a full range of diagrams, illustrations, graphics, screenshots, tables, and instructions required to perform supported system functions. Manuals shall be provided in electronic format. As a guiding principle for the development of the ETCS user manuals, all necessary documentation shall be provided to allow a third party to maintain, configure, and test any proposed customized components of the system. The TSI shall keep all user manuals current for the duration of the contract, as described in Section 2.7.6.5, Online Document Sharing and Document Management System.

The TSI shall develop and submit the ETCS User Manual for CTRMA to review, comment, and approval. This manual shall cover all aspects of each subsystem functionality accessible by a GUI, including authentication, screen navigation, menu items, and descriptions, drill-down capability and description, graphics capability, report generation, and maintenance features. Instructions and guidelines for power-up and shut-down, configuration settings, online component replacement, system administration tasks including back-up, recovery, and archiving data and files, and disaster recovery demonstration testing. Screen views shall be including an explanation of each field, drop-down menu choice, links, and navigation buttons.

System User Manuals required for the project include the following, at a minimum:

1. Reporting manual (refer to Section 2.19.1, Reports Manual)
2. Roadside system flow diagram (that illustrates how the roadside works to generate transactions/images and send upstream for host processing)
3. DVAS Manual
4. Audit and Reconciliation Manual
5. Dynamic Pricing and Trip Building Manual
6. MOMS User Manual

2.20 INTELLIGENT TRANSPORTATION SYSTEMS (ITS) MAINTENANCE

CTRMA may request the TSI to perform maintenance services on the existing and/or proposed ITS, as identified in this document. These supplemental services may include installation, maintenance, and repairs for existing and future ITS devices and infrastructure, owned by CTRMA, referred to hereinafter as the ITS. The ITS may consist of, but is not limited to, the following:

1. Device grounding and surge suppression
2. Conduit, laterals, and duct bank
3. Communications cable
4. Pull, splice, and junction boxes
5. Electrical power service assemblies
6. Device poles and mounting assemblies

7. Radar Vehicle Sensing Device (RVSD)
8. Bluetooth reader devices
9. Equipment, network, and remote cabinets
10. Video equipment, including CCTV cameras, video encoders/decoders, and video wall components
11. Network devices, including aggregation/distribution, edge switches, terminal servers, Ethernet extenders, and media converters
12. Highway signing, including DMS, embedded dynamic messaging signs (EDMS), and electronic display signs, as well as supporting structures
13. Connected Vehicle (CV) infrastructure, including roadside units (RSU) and in-cabinet equipment
14. Wrong Way Driving Systems (WWDS)
15. Wireless communication devices
16. Communications hubs and equipment shelters
17. Environmental conditioning equipment
18. UPS (future)
19. Ramp metering assemblies (future)
20. Visibility Sensors (future)
21. Road weather information systems (RWIS) (future)
22. Ancillary facilities (i.e., LoneStar® data servers and workstations)
23. Advanced Traffic Management Systems (ATMS) software
24. Application-Specific software packages (e.g., Video Analytics, Connected Vehicle applications)
25. Automated License Plate Readers (ALPRs)
26. Hardware, software, and firmware related to ITS equipment and other traffic control devices

2.20.1 Services to be Provided

Maintenance of the ITS may include scheduled maintenance, non-scheduled maintenance and repairs, and emergency repair services.

2.20.1.1 Scheduled Maintenance Services

The TSI will coordinate the frequency of scheduled maintenance services with CTRMA. The TSI will be responsible for responding to maintenance requests according to the priority assigned by CTRMA. At the discretion of CTRMA, the TSI may be dispatched to any work priority deemed appropriate by CTRMA.

2.20.1.2 Device Site Deficiencies

In the event the TSI encounters minor and/or major device deficiencies while performing preventive maintenance services as outlined above, the TSI shall correct such deficiencies during the preventive maintenance site visit whenever possible. CTRMA shall approve major device deficiencies corrections.

CTRMA considers minor deficiencies to be items such as, but not limited to, an unplugged device cable, tripped circuit breaker, or loose connector. CTRMA considers major deficiencies to be items such as, but not limited to, a non-functional device site with damaged equipment, components exposed to weather, exposed power cabling, or items constituting a safety hazard. The TSI would immediately contact CTRMA to report major deficiencies.

2.20.1.3 Non-Scheduled Maintenance and Repairs

Non-scheduled maintenance includes reactive maintenance, replacements, and diagnostic work necessary to correct deficiencies and keep the ITS operational. This work is not scheduled but is often generated by failures caused by acts of God, construction, or accidents. Non-scheduled maintenance may include, but is not limited to:

1. Field repair or replacement of ancillary parts or equipment for any ITS device
2. Resetting DMSs
3. Resetting and focusing CCTV lenses
4. Resetting RVDS
5. Resetting RSUs
6. Resetting WWDS detection
7. Configuring or repairing the communications network, including switches and terminal servers
8. Configuring or repairing CCTV video transmission equipment, including encoders and decoders, as applicable
9. Testing fiber optic cable (FOC) for optical budget requirements
10. Repairing damage caused by vandalism or accidents

If the cause of a failure is unknown, CTRMA may have the TSI perform diagnostic work as required to determine the cause of the failure.

2.20.2 Diagnostic and Troubleshooting Services

The TSI may be required to provide diagnostic and troubleshooting services when equipment is inoperable, and field troubleshooting is needed to identify the problem, as coordinated with CTRMA. Diagnostic and troubleshooting services include, but are not limited to:

1. Field diagnostic testing and troubleshooting
2. Minor equipment repairs following diagnosis
3. Diagnostic and repair report/documentation
4. Equipment failure/defective equipment investigation

2.20.3 Repair Services

Repairs and/or parts replacement may be covered under this effort, as approved by CTRMA. The TSI will submit a written request(s) to CTRMA for approval of any additional labor usage and expenditures that are not covered. Descriptions of additional labor, materials, and equipment will be included as part of a work request as well as a justification for the work. Repairs that require expertise and/or specialized equipment of the manufacturer will be considered original equipment manufacturer (OEM) repairs. OEM repairs are those specialized repairs that cannot be made by the TSI and must be made by a manufacturer or vendor of the

equipment/component. In the event a device manufacturer is no longer producing, selling, or repairing a specific device, the TSI will research, price, and present an alternative product to CTRMA.

The TSI is required to assure CTRMA that warranties are not voided by TSI repair services or other actions of the TSI at any point during the contract. If a device warranty expires, the TSI will notify CTRMA for the option to renew and/or replace the device if the unit is non-operational.

2.20.3.1 Field Site Repair

The TSI will have the necessary equipment and personnel capable of maintaining and repairing the field equipment and infrastructure deployed throughout the geographic coverage area of CTRMA. This includes a variety of devices and communications infrastructure. Field site repair includes, but is not limited to, device replacement, electrical service work and repair, optical fiber cable splicing and troubleshooting, Optical Time Domain Reflectometer (OTDR) testing, fiber enclosure/fiber distribution panel installations, and terminations, as necessary.

The TSI will have the capability to install both open trench and directional bore conduit for new installation and replacement of damaged conduit. It may be the responsibility of the TSI to perform all subsurface utility engineering (SUE) and obtain any permits required before the TSI commences any work, as requested by CTRMA. After completion of the device and/or communications infrastructure work by the TSI, a report will be presented to CTRMA for record-keeping of changes made to the fiber communication infrastructure and other components of the ITS.

1. **Minor Repair:** Minor repairs/replacement of ITS components due to equipment malfunction or end-of-service-life. Minor repairs also include, but are not limited to, reattaching loose cable connections, power reset of all equipment, and other incidental repair work. The TSI will perform the necessary repair/replacement work, which includes diagnostic services.
2. **Major Repair:** Major repairs are defined as non-typical repairs that need diagnostic services to identify the problem, extensive repair services, MOT and lane closures, utility coordination, or other regional agency coordination, such as damage caused by crashes, vandalism, theft, weather events, fiber cuts, power loss from the utility service point, and construction activity. Typical major repairs and parts replacement consist of but are not limited to, repair or replacement of damaged, missing, or malfunctioning equipment to maintain the ITS operation and functionality.
3. **Warranty Repair:** The TSI will act on behalf of CTRMA to track manufacturer warranties and pursue warranty repairs from device manufacturers when the manufacturer's warranty covers failures. The TSI is responsible for coordinating warranty repairs with CTRMA and the device manufacturer/reseller.

2.20.3.2 Equipment Replacement

This work may include furnishing replacement devices needed for the maintenance of the ITS, as required. Technical data sheets for all new replacement parts will be required to be

submitted and approved by CTRMA. Proposed replacement parts will be the latest compatible technology, equal to or better in function and quality to existing ITS components or equipment.

2.20.4 Emergency Repair Services

Emergency services consist of the restoration of components resulting from any malfunction or damage that creates a safety hazard or severely reduces the operational effectiveness of the overall ITS. The TSI may immediately correct any safety hazards discovered in the ITS, as requested by CTRMA. Failures tend to be caused by severe and unusual forces of nature, crashes and collisions, vandalism, theft, fire, erosion, and extreme exposure to chemicals or pollutants.

The TSI will be required to document malfunction and damage that necessitates emergency repair services. At a minimum, documentation will include:

1. Device location, type, model, and serial and control number
2. Date and time of the incident
3. Cause of failure and name of the person reporting failure
4. The site needs analysis and digital photo documentation
5. Immediate repairs and corrective actions are taken, including temporary repairs and repair cost breakdown
6. Corrective actions necessary for permanent repairs to be performed, including parts list, schedule, and estimated cost

2.20.5 Equipment Logs

The TSI will be required to document equipment and activities performed at each ITS device location. The TSI will be required to maintain an equipment log that documents preventive scheduled maintenance and repair services, including repair logs, parts replacement, special notes, recommendations, and equipment warranty records. Device records will be required to include, but will not be limited to:

1. Device location, number, and type
2. Model and serial number
3. Firmware version
4. Manufacturer
5. Date, time, and description of the failure
6. Report of failure source
7. Response details including arrival time, site conditions, and actions are taken
8. Resolution details with documentation
9. Spare part used, including type, model, serial, and control number
10. Replacement part notes and repair actions

2.21 DATA PLATFORM

CTRMA may request at CTRMA's option the TSI to develop a back-office architecture design that provides to provide additional Data Platform Hosting and development of a transaction processing system, including the following:

1. Centralized, secure, and redundant data hosting for all data entities necessary for toll transaction processing
2. External data exchange points that provide flexible structured transaction data transmissions to and from third parties
3. Multi-step modular pricing and discounting business logic
4. Auditable data governance and security
5. UX/UI-driven data and business process administration
6. Public, external, and internal fixed reporting & cached data access

2.21.1 Data Platform Releases

CTRMA has organized the Data Platform program into multiple releases as described in Sections 2.21.1.1 through 2.21.1.6.

2.21.1.1 Release 1 Data Platform

1. Assessment, selection, and implementation of hosting solution(s)
2. Hosting topology design and hardware/software implementation
3. Selection, licensing, and implementation of data platform application(s)
4. Defining rules/requirements for Availability, Retention, and Recovery
5. Availability, Capacity, Redundancy, Security, et. al. declaration and testing
6. Development of Fixed Toll Road Transaction database(s) and relationships
7. Design, development, and testing for external Fixed Toll Road Transaction data exchanges (Fixed file, API, XML, JSON)
8. Policies & Procedures documentation
9. Initialization of Source Data Entity Catalog
10. Assessment, selection, and implementation of e-discovery toolset(s)

2.21.1.2 Release 2 Interim Routing & Data Exchanges

1. Development of IOP Hub database(s) and relationships
2. Development of DMV Hub database(s) and relationships
3. Design, development, and testing for external IOP Hub data exchanges (Fixed file, API, XML, JSON)
4. Design, development, and testing for external DMV Hub data exchanges (Fixed file, API, XML, JSON)
5. Policies & Procedures documentation
6. Revision of Source Data Entity Catalog
7. Development of automated business process(es) for payor ID and payment path routing logic

8. Development of UX/UI for monitoring and reporting of automated business process(es) for payor ID and payment path routing logic

2.21.1.3 Release 3 Data Governance & Reporting Cache

1. Development of Reporting Cache data platform
2. Development of Public Reporting database(s) and relationships
3. Implementation and testing of data push from master data source to Reporting Cache
4. Development of automated Public Report(s) generation
5. Design, development, and testing for Public Reporting data exchanges (Fixed file, API, XML, JSON)
6. End-to-end testing of Reporting Cache and Public Reporting exchange solutions
7. Support for establishment of Data Governance strategy and approach
8. Definition of Data Use criteria
9. Automation of Data Governance process(es) including certification and affirmation for data use
10. UX/UI for administration and facilitation of Data Governance process(es)
11. Documentation of Data Governance Policies & Procedures
12. Development of Data Governance Awareness training, compliance, and certification
13. Declaration and implementation of Data Governance Audit(s)

2.21.1.4 Release 4 Reporting & Analytics

1. Development of External Reporting database(s) and relationships
2. Development of Internal Reporting database(s) and relationships
3. Implementation and testing of data push from master data source to Reporting Cache
4. Development of automated External Report(s) generation
5. Development of automated Internal Report(s) generation
6. Design, development, and testing for External Reporting data exchanges (Fixed file, API, XML, JSON)
7. End-to-end testing of Reporting Cache, Internal, and External Reporting exchange solutions
8. Assessment, selection, procurement, and implementation of Internal Reporting & Analytics tool(s)
9. Development of initial suite of internal analytics reports (per identification and prioritization)

2.21.1.5 Release 5 Pricing & Invoicing Automation

1. Development of Product database(s) and relationships
2. Development of Discount database(s) and relationships
3. Development of Invoice database(s) and relationships
4. Design and development of automated Product Management process(es)
5. Design and development of UX/UI for Product Management
6. Design and development of automated Discount Management process(es)

7. Design and development of UX/UI for Discount Management
8. Design and development of automated Invoice Management process(es)
9. Design and development of UX/UI for Invoice Management
10. Development of UX/UI for monitoring and reporting of automated business process(es) for end-to-end Transaction Pricing & Invoicing process(es)
11. Design, development, and testing for Pay by Mail('PBM') Invoice data exchanges (Fixed file, API, XML, JSON)
12. Design, development, and testing for IOP Hub Invoice data exchanges (Fixed file, API, XML, JSON)

2.21.1.6 Ongoing Operations, Maintenance and Support

1. Managed Services for Hosting Administration & Support
2. Managed Services for Database Administration & Support



CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

**Agreement
for
Electronic Toll Collection System
Integration and Maintenance Services**

Appendix 10

Lane System Business Rules

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10 BUSINESS RULES

10.1 PURPOSE

The purpose of this document is to track and maintain the CTRMA’s business rules. This document is a living document. When a business rule is changed, the “Last Update” date will be updated with the date the rule was recorded. Any additional notes may be maintained in the revision history.

Values stated in the “Value” column of the rules are understood to be user-configurable and not system-related changes.

10.2 GENERAL BUSINESS RULES

General business rules apply to every transaction unless superseded by a rule within the Express Lanes Business Rules section.

10.2.1 Transaction Pricing Business Rules

The business rules in this section address the aspects of applying toll rates to transactions.

Table 10-1: Transaction Pricing Business Rules

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
CTRMA-TLP-1	LBR-TR-01	Time of Day Pricing	Toll rates are variable based on a pre-defined time of day pricing that is configurable per hour of day and day of the week.	December 2019
CTRMA-TLP-2, BR-1	BR-1	Axle-based Classification	Vehicle classification methodology used at CTRMA. Toll rates are variable based on the pre-defined Axle-based classification scheme.	December 2019
BR-2, CTRMA-TC-3	BR-2	2 through 6	Allowable vehicle classifications.	December 2019
BR-3, CTRMA-TC-3	BR-3	<= 2 axles	The number of axles on a class 2 vehicle.	December 2019
BR-4, CTRMA-TC-3	BR-4	3 axles	The number of axles on a class 3 vehicle.	December 2019
BR-5, CTRMA-TC-3	BR-5	4 axles	The number of axles on a class 4 vehicle.	December 2019

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
BR-6, CTRMA-TC-3	BR-6	5 axles	The number of axles on a class 5 vehicle.	December 2019
BR-7, CTRMA-TC-3	BR-7	6+ axles	The number of axles on a class 6 vehicle.	December 2019
CTRMA-TLP-3	LBR-TR-02	Toll Rate Configuration	Toll rates may be configured based on how the transaction originated (AVI, Video), and how the transaction is pursued (Processing Hub based on the TVL or LVL, or Toll Bill process (Pay by Mail) and the vehicle's Axle-based Classification.	December 2019
CTRMA-TLP-4, BR-8	BR-8	AVI Toll Rate	Toll rate applied for AVI Transactions that match to a valid entry in the TVL, the toll rate applied will be the AVI Rate.	December 2019
CTRMA-TLP-4a, BR-8	BR-500	AVI Toll Rate	Toll rate applied to Image-based Transactions that match to a valid entry in the TVL.	December 2019
CTRMA-TLP-5, BR-9	BR-9	PBM Toll Rate	Toll Rate applied to Image-based Transactions matched to a valid entry in the LVL.	December 2019
CTRMA-TLP-6, BR-10	BR-10	PBM Toll Rate	Toll Rate applied to Image-based Transactions that do not match to a valid entry in the TVL or LVL and are pursued through the Toll Bill process in the BOS.	December 2019
CTRMA-TLP-8	LBR-TR-03	Toll Rate Implementation	A new rate will go into effect immediately following the scheduled time or day as dictated according to the pre-defined time of day schedule.	December 2019
BR-18, BR-20	BR-18	\$0.00	Toll Rate when the lane is closed.	December 2019

10.2.2 In-Lane Transaction Processing Business Rules

This section describes the business rules related to transaction processing at the lane level.

Table 10-2: In-Lane Transaction Processing Business Rules

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
BR-11	BR-11	Vehicle presence (every vehicle's image is saved)	Reasons for saving an image of the vehicle in the lane.	December 2019
BR-12	BR-12	Front and Rear	Images saved for each vehicle in the lane.	December 2019
BR-13	BR-13	Minimum of 1 image	The number of images saved of the front of the vehicle.	December 2019
BR-14	BR-14	Minimum of 1 image	The number of images saved of the rear of the vehicle.	December 2019
BR-15	BR-15	AVC	Default vehicle classification (unless the vehicle classification system is degraded).	December 2019
CTRMA-TC-4, BR-16	BR-16	Transponder class (if a tag is present) or Class 2 (2 axles)	Default vehicle classification if the AVC is degraded. Transactions created when the vehicle classification system is degraded are flagged and reported.	December 2019
CTRMA-TC-1, BR-19	BR-19	Spurious Tag Read	Transponders that were sent from the Reader to the Zone Controller properly but were unable to be correlated to a vehicle/transaction in Zone Controller and TFH correlation, are recorded as a spurious tag read and not used for any further processing. Spurious Tag Reads are reported to assist in measuring lane	December 2019

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
			performance for all tolling points.	
CTRMA-TC-2	BR-501	Buffered Tag Read	<p>Transponders that were not sent from the Reader to the Zone Controller properly (delayed) but were unable to be correlated in TFH correlation, are recorded as a Buffered Tag Reads and not used for any further processing.</p> <p>Buffered Tag Reads are reported to assist in measuring lane performance for all tolling points.</p>	December 2019
CTRMA-TC-3	BR-502	Normal Tag Read	<p>Transponders that were successfully sent from the Reader to the Zone Controller and correlated to vehicle/transactions are recorded as a "Normal" Tag Read Transaction and processed in accordance with approved business rules and workflows.</p> <p>Normal AVI Transactions are reported to assist in measuring lane performance for all tolling points.</p>	December 2019
CTRMA-TC-7, BR-17	BR-17	Multi-transponder Reads	<p>If multiple Transponders are read in the lane for one vehicle, the first Valid Tag with the most recently updated tag status is used. All other transponder reads are recorded and associated with the transaction, but not used for billing purposes.</p>	December 2019

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
			The transponder used for payment or billing is marked as such.	
CTRMA-TC-5	LBR-TP-01	Date/Time the vehicle exits the toll point	Transaction Date/Time. The timestamp of the transaction. The format of the timestamp is to the millisecond: HH:MM:SS.000. Note: The following timestamps are available for reporting: entry (when the transaction enters the tolling zone,) tag acquisition (when the tag is read), and exit (when the transaction exits the tolling zone.)	December 2019
CTRMA-TC-6, BR-22	BR-22	Tag Status	Transponders that are read and included in AVI Transactions are compared to the Tag Validation List in the Central Host to determine tag status. The tag status is recorded in the transaction.	December 2019

10.2.3 Image Review Business Rules

This section describes the business rules related to image review.

Table 10-3: Image Review Business Rules

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
BR-40	BR-40	Unlimited	The number of times an image can be reviewed.	December 2019
BR-45	BR-45	100%	Percentage of transactions and images requiring review after the transactions and images enter the image review process.	December 2019

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
CTRMA-OCRIR-1, BR-41	BR-41	OCR Review	Each image of a transaction will go through OCR review first and be assigned an OCR confidence value.	December 2019
CTRMA-OCRIR-2	LBR-IR-01	Manual Review	A manual review is performed at the transaction level. Individual transactions are sent for manual review, and one result is returned for the transaction (rather than one result per image).	December 2019
NEW	LBR-IR-02	Front Image	Image selected when the vehicle classification is > 2 axles.	December 2019
CTRMA-OCRIR-3	LBR-IR-03	Every Image (configurable)	Image confidence requiring manual image review.	December 2019
CTRMA-OCRIR-4	LBR-IR-04	Manual Review Result	If a transaction is sent to manual review, the result of this review will take precedent over any other reviews performed by OCR. In other words, the manual review result is always the license plate value that will be applied to the transaction.	December 2019
CTRMA-OCRIR-5, BR-46	BR-46	No Plate, Motorcycle, Out-of-State, Temporary Plate, Unreadable Plate, Camera Issue	Manual Image "Code offs" during Image Review.	December 2019
CTRMA-OCRIR-6	LBR-IR-05	Supervisor Escalation	A manual review will be escalated to a supervisor for review if one of the following conditions is met: <ol style="list-style-type: none"> 1. The transaction is marked as a code-off 2. The transaction has had 4 (configurable) 	December 2019

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
			reviews without two (configurable) matching reviews	
BR-42	BR-42	2	The number of times an image review must match before the review is accepted (includes being coded off).	December 2019
BR-43	BR-43	14 days from the Transaction Date	The maximum amount of time an image should be in image review.	December 2019
CTRMA-OCRIR-7	LBR-IR-06	Image Review Complete Criteria	Image review will be considered complete when one of the following conditions is met: <ol style="list-style-type: none"> 1. The transaction has two independent matching reviews 2. The transaction has been reviewed by a supervisor 	December 2019
CTRMA-OCRIR-8	LBR-IR-07	OCR Review Qualification	The result of OCR will be counted as one of the 4 (configurable) allowable reviews when the confidence level is ≥ 90 (configurable).	December 2019
CTRMA-OCRIR-9	LBR-IR-08	Rejected Transaction Finalization	Transactions that are rejected (coded-off) during image review will not be pursued further.	
BR-44	BR-44		At any time, a supervisor may override the image review results prior to the transaction exiting the image review process, and the review will be accepted.	December 2019
BR-32	BR-32		After image review, rejected images (a.k.a. "code offs") will not be pursued further.	December 2019

10.2.4 Central Host Processing Business Rules

This section describes the business rules related to the processing of Transactions at the Central Host.

Table 10-4: Central Host Processing Business Rules

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
BR-35	BR-35		An Exempt Vehicle List (containing license plates and tags) is maintained so that vehicles, in accordance with CTRMA’s non-revenue policy, are allowed non-revenue access. For example, First Responders are maintained on this list.	December 2019
BR-36	BR-36		Exempt Vehicle List may be used for quarantining transactions from license plates that have special billing arrangements with CTRMA.	December 2019
CTRMA-HP-11, BR-33, BR-34, BR-38	BR-33	Exempt Vehicle Processing, TVL, LVL	Order in which Transactions are processed. Every Transaction should be compared to the following: <ol style="list-style-type: none"> 1. The Exempt Vehicle List before any payment processing takes place. If the vehicle exists in good standing within the Exempt Vehicle List, the transaction should be marked as non-revenue, and no further processing takes place. 2. If there is no match to the Exempt Vehicle List, the Transaction is 	December 2019

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
			<p>compared to the TVL</p> <p>3. And, then, the LVL. If the transaction matched the TVL or the LVL, the transaction is sent to the processing hub.</p>	
NEW	BR-505	Duplicate Transaction	<p>Multiple transactions for the same vehicle shall not be processed, and may consist of the following:</p> <ol style="list-style-type: none"> 1. An AVI Transaction and Video Transaction for the same vehicle at the same location, direction, and time (within a threshold parameter). 2. Multiple AVI Transactions for the same vehicle at the same location, direction, and time (within a threshold parameter). 3. Multiple Video Transactions for the same vehicle at the same location, direction, and time (within a threshold parameter). 	December 2019
BR-23	BR-23	All, irrespective of status	<p>AVI Transactions are sent to the processing hub to determine if they will post to the Home Agency customer accounts or be accepted by the Home Agency.</p>	December 2019
BR-24	BR-24		<p>Transactions with a disposition of "Posted" from the processing hub will not be processed further.</p>	December 2019

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
BR-37	BR-37		Transactions rejected by the Processing Hub that have already been through Image Review will be compared against the Non-Revenue list (again) before being sent for Toll Bill processing.	December 2019
BR-25	BR-25	999	The number of times a transaction can be resubmitted to the Processing Hub. It is expected that the time limit for resubmitting transactions will expire before the number of retries.	December 2019
	BR-503	10	The number of times a transaction is resubmitted when a "System/Communication Error" (S) is returned from the Processing Hub.	December 2019
	BR-504	3	The number of times a Transaction is resubmitted when a "Not Posted" (N) is returned from the Processing Hub.	December 2019
BR-26	BR-26	60 days from the transaction date	Amount of time the Central Host must submit or resubmit a transaction to the Processing Hub for processing.	December 2019
BR-27	BR-27		AVI Transactions must have a rejected Processing Hub disposition before being sent to image review.	December 2019
BR-28, CTRMA-HP-7	BR-28	96 hours	Amount of time the Central Host should wait for a disposition from the Processing Hub before alerting CTRMA of a potential problem.	December 2019
BR-29, CTRMA-HP-8	BR-29	15 days	The maximum amount of time the Central Host	December 2019

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
			should wait for a disposition from Image Review before alerting CTRMA of a potential problem.	
BR-39	BR-39	Five days from the transaction date	Transactions must be sent to VPC for processing within this amount of time.	December 2019
CTRMA-HP-2	LBR-CH-01	25 Days	The number of days from the transaction date that the transactions must be sent for billing.	December 2019
CTRMA-HP-3	LBR-CH-02	Pay by Mail Sending Allowance	Pay by Mail transactions must be sent for billing within 60 (configurable) days of the transaction timestamp.	December 2019
CTRMA-HP-4	LBR-CH-03	Tag Transaction Image Review	Valid Tag-based transactions must have a final rejected HUB disposition (after being resubmitted, if applicable) prior to being sent for image review.	December 2019
CTRMA-HP-5	LBR-CH-04	iToll Processing	After Image Review, the plate will be compared against the TVL and License Plate Validation List (LVL) for qualification as an iToll transaction.	December 2019
CTRMA-HP-6	LBR-CH-05	LVL Matching	A transaction qualifies as matching a plate within the LVL if the plate assigned to the transaction matches a plate within the LVL that is either current or has expired in the last 30 (configurable) days.	December 2019

10.2.5 Data Retention Business Requirements

This section describes the business rules related to data retention.

Table 10-5: Data Retention Business Rules

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
CTRMA-HP-9, BR-30	BR-30	7 (configurable) months from transaction date.	The maximum amount of time images will be stored for paid transactions.	December 2019
CTRMA-HP-10, BR-31	BR-31	2.5 years from the transaction date	The maximum amount of time images will be stored for transactions that have not been paid.	December 2019
NEW	LBR-DR-01	30 Days	Minimum number of days data must be stored in the Lane Controllers.	December 2019

10.3 EXPRESS LANE BUSINESS RULES

The business rules described in this Section will take precedence over those described in Section 10.2, General Business Rules.

10.3.1 Express Lane Usage Business Rules

This Section describes the business rules governing the use of the Express Lane by drivers.

Table 10-6: Express Lane Business Rules

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
MOPAC-ELU-1	LBR-ELU-01	Express Lane Access	Access to the express lanes is only allowed at designated entry and/or exit locations.	December 2019
MOPAC-ELU-2	LBR-ELU-02	Express Lane Separation	The express lanes will be separated from the general-purpose lanes by barrier sticks.	December 2019
MOPAC-ELU-3	LBR-ELU-03	Segment Definition	The travel facility is divided into segments. Each segment consists of a single corresponding toll point. The northbound facility consists of the segments: <ol style="list-style-type: none"> 1. Enfield 2. Far West The southbound facility consists of the segments: <ol style="list-style-type: none"> 1. RM2222 2. Parmer 	December 2019

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
MOPAC-ELU-4	LBR-ELU-04	Toll Point Definition	A toll point is a physical location where vehicles are detected by the transponder and/or license plate number.	December 2019

10.3.2 Express Lane Operations Business Rules

This section describes the business rules for operating the Express Lanes.

Table 10-7: Express Lane Operations Business Rules

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
MOPAC-ELO-1	LBR-ELO-01	Tolling Operation	Express lane hours of operation shall be configured on a per-segment basis to a maximum of 24 hours a day, seven days a week, and 365 days a year.	December 2019
MOPAC-ELO-2	LBR-ELO-02	Non-Tolling Operation	During non-tolling operations, the express lanes shall be either closed or open to all vehicles.	December 2019
MOPAC-ELO-3	LBR-ELO-03	Non-Tolling Data Collection	During non-tolling operations, the system will continue to gather information, read transponders, and capture license plate images, but the collected data will not be utilized for billing purposes.	December 2019
MOPAC-ELO-4	LBR-ELO-04	Manual Overrides	The system may be manually placed in a non-tolling mode (as described in MOPAC-ELO-2), and the system will continue to gather data as described in MOPAC-ELO-3.	December 2019
MOPAC-ELO-5	LBR-ELO-05	VTMS Pricing Display	Each VTMS will display a maximum of 2 destinations at a time and the associated toll rates.	December 2019

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
MOPAC-ELO-6	LBR-ELO-06	VTMS Pricing Lock	During normal operations, a customer will be charged the price displayed on the VTMS at the point the customer enters the express lane.	December 2019
MOPAC-ELO-7	LBR-ELO-07	VTMS Non-Tolling Display	During non-tolling operation, the General Message LED Panel of the VTMS will display a configurable message up to 7 characters in length, including blanks.	December 2019
MOPAC-ELO-8	LBR-ELO-08	VTMS Comms Failure	In the event of a communications failure to the VTMS, the affected VTMS will display locally stored rates that are stored directly on the VTMS. The VTMS will initially display the last published message/toll rate for 10 minutes (configurable) before failing over to the locally stored rates.	December 2019
MOPAC-ELO-9	LBR-ELO-09	VTMS Display Failure	In the event of a display failure in which a VTMS is partially or completely blank, customers will be charged \$0.00.	December 2019
MOPAC-ELO-10	LBR-ELO-10	VTMS Incident Display	In the event of a traffic incident or lane closure, the toll rate message on the VTMS can be manually overridden by an authorized express lane operator with a message from a pre-determined set of allowable messages.	December 2019
MOPAC-ELO-11	LBR-ELO-11	VTMS Incorrect Fare	If a VTMS does not display the expected fare, the displayed fare shall be charged, and the system will immediately attempt to publish the correct rate.	December 2019

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
MOPAC-ELO-12	LBR-ELO-12	VTMS Toll Display	During the normal operational state, the VTMS will display toll rates determined by the following hierarchy: <ol style="list-style-type: none"> 1. The value was manually overridden/selected 2. Dynamic Pricing Algorithm 3. Time of Day Rate Schedule 4. Default Rates 5. Locally Stored Rates 	December 2019
MOPAC-ELO-13	LBR-ELO-13	Toll Rate Adjustment (Traffic Incident)	In the event of an incident or accident, Toll Rates for the entire Travel Facility or individual segment can be manually overridden by an authorized express lane operator. This override can be applied to the entire travel facility or one or more segments for a specified time and can include a past period (e.g., retroactively).	December 2019
MOPAC-ELO-14	LBR-ELO-14	ELO Toll Management	Authorized express lane operators will have the capability to manually set a toll rate or select the use of rate schedule pricing.	December 2019
MOPAC-ELO-15	LBR-ELO-15	Lane Closure (Maintenance)	The Express Lane may be placed in closed mode by segment as necessary to perform preventive and corrective maintenance on tolling equipment in the lane and on the roadside. During closures, VTMS will display a "CLOSED" message, and transaction data will be captured with a rate of \$0.00.	December 2019

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
MOPAC-ELO-16	LBR-ELO-16	VTMS Allowable Messages	The following approved messages are allowable when performing manual overrides of the VTMS: CLOSED FREE	December 2019

10.3.3 Express Lane Pricing Business Rules

The business rules in this section address all the aspects of traffic data collection/usage and setting/applying toll rates.

Table 10-8: Express Lane Pricing Business Rules

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
MOPAC-ELP-1	LBR-ELP-01	Dynamic Pricing Definition	Toll rates are dynamically priced using a controller algorithm. The algorithm can consider only the Express Lane or a combination of both the Express Lane and the General-Purpose lanes traffic density and/or volumes and/or vehicle speeds to evaluate demand and determine the corresponding toll rate.	December 2019
MOPAC-ELP-2	LBR-ELP-02	Pricing Hardware Configuration (Express Lane)	The traffic detection devices shall feed the dynamic pricing controller algorithm traffic data from the Express Lane no less than every 30 seconds (configurable).	December 2019
MOPAC-ELP-3	LBR-ELP-03	Pricing Hardware Configuration (General Purpose Lane)	The traffic detection devices shall feed the dynamic pricing controller algorithm traffic data from the General-Purpose lanes no less than every 30 seconds (configurable).	December 2019
MOPAC-ELP-4	LBR-ELP-04	Rate Calculation	For each segment, all data from the traffic detection devices within the direction	December 2019

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
		(Default Config)	of travel of the entire facility may be used for the algorithm's calculation.	
MOPAC-ELP-5	LBR-ELP-05	Rate Calculation (Required Data)	Based upon the traffic detection device mappings, 50% of lanes traffic data coverage is needed, and no more than 1.5 miles of spatial coverage can be missing in order for the algorithm to calculate the Toll Rate.	December 2019
MOPAC-ELP-6	LBR-ELP-06	Rate Calculation (Insufficient Data)	If the configurable number of mapped traffic detection devices are not available at the required interval or do not have data, the Toll Rate will be based upon the volume at the toll plaza points.	December 2019
MOPAC-ELP-7	LBR-ELP-07	Rate Calculation (Discarded Data)	If data from any specific traffic detection device is degraded or not available at the required interval to feed the algorithm, it will not be considered during the algorithm calculation.	December 2019
MOPAC-ELP-9	LBR-ELP-08	Rate Calculation (Subsegment Config)	Segments may have multiple traffic detection devices that take priority and have a higher value for the algorithm to consider.	December 2019
MOPAC-ELP-10	LBR-ELP-09	Minimum Toll Rate	The Minimum Toll Rate for any one segment trip is \$0.25 (configurable). The minimum Toll Rate for any multi-segment trip is \$0.50 (configurable).	December 2019
MOPAC-ELP-11	LBR-ELP-10	Maximum Toll Rate Facility	The Maximum Toll Rate allowed on the Express Lane during Hours of operation will be \$99.99 for the entire facility (configurable).	December 2019

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
MOPAC-ELP-12	LBR-ELP-11	Toll Rate Display Interval	The Toll Rate displayed on the VTMS signs shall be automatically updated every 4 minutes (configurable).	December 2019
MOPAC-ELP-13	LBR-ELP-12	Toll Rate Increase Config	For each rate cycle, the Toll Rate will not automatically increase by more than \$1.00 per segment.	December 2019
MOPAC-ELP-14	LBR-ELP-13	Toll Rate Decrease Config	For each rate cycle, the Toll Rate will not automatically decrease by more than \$1.00 per segment.	December 2019
MOPAC-ELP-15	LBR-ELP-14	Full Trip Toll Rate	The entire Travel Facility price should never be less than an individual segment.	December 2019
MOPAC-ELP-16	LBR-ELP-15	Displayed Rate	The rate displayed on the VTMS will reflect the base price for an Automatic Vehicle Identification (AVI) transaction.	December 2019
MOPAC-ELP-17	LBR-ELP-16	Toll Scheduling	Dynamic Pricing will have configurable parameters (called toll schedules), and there can be numerous such toll schedules that can be used for different traffic/anomaly conditions.	December 2019
MOPAC-ELP-18	LBR-ELP-17	Manual Override & TOD Dynamic Pricing Impact	Dynamic Pricing will continue to run in the background when pricing is in time of day or manual mode.	December 2019
MOPAC-ELP-19	LBR-ELP-18	Maximum Manual Override Toll Rate Increase	The maximum toll rate increase implemented by a manual override shall be \$10.00.	December 2019
MOPAC-ELP-20	LBR-ELP-19	Maximum Manual Override Toll Rate Decrease	The maximum toll rate decrease implemented by a manual override shall be \$10.00.	December 2019

10.3.4 Trip Building Business Rules

This section focuses on how lane transactions from tolling points are associated with trips using the trip building process.

Table 10-9: Trip Building Business Rules

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
BR-21	BR-21	Within 72 hours of the Transaction Date	Amount of time in which Trips must be built.	December 2019
MOPAC-TB-1	LBR-TB-01	Trip Transaction	Lane Transactions in the same direction of travel along the entire Travel Facility or a combination of Segments will be assembled into Trip Transactions in the Central Host.	December 2019
MOPAC-TB-2	LBR-TB-02	Trip Direction Restriction	Only transactions from the same direction of travel can be included in a trip per facility. The Mopac Express Lanes have the northbound or southbound direction of travel.	December 2019
MOPAC-TB-3	LBR-TB-03	Lane Transaction to Trip Transaction Relationship	A single unique Lane Transaction will not be included in more than one Trip Transaction. The relationship should be one or many Lane Transactions to a single Trip Transaction, not many Trip Transactions to a single Lane Transaction.	December 2019
MOPAC-TB-4	LBR-TB-04	Trip Travel Time	The allowable travel time for the northbound direction of travel shall be one hour, and southbound shall be one hour, both configurable. The travel time will establish the length of time for which transactions can be formed into a trip.	December 2019

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
MOPAC-TB-5	LBR-TB-05	Segment Travel Time	The allowable travel time for a given Segment shall be configurable.	December 2019
MOPAC-TB-6	LBR-TB-06	Lane Transaction Association to a Trip Transaction	Lane Transactions received at the Central Host shall be associated with the same Trip Transaction if the Lane Transactions meet the following criteria: <ol style="list-style-type: none"> 1. The transponder ID and/or license plate number identification is sufficient for the association. 2. A geographically possible sequence of segment transactions (for example, northbound progression). 3. The transaction is part of the defined trip definition of the trip transaction 4. Allowable Trip/Segment travel time. 	December 2019
MOPAC-TB-7	LBR-TB-07	Non-AVI Lane Transaction Association to a Trip Transaction	For vehicles with no transponder, the Lane Transactions will be associated with the same trip if the license plate numbers are determined to be for the same vehicle.	December 2019
MOPAC-TB-8	LBR-TB-08	AVI Lane Transaction Association to a Trip Transaction	If a Transponder ID is detected at all Toll Segments during a vehicle's travel, a trip transaction will be formed based on the common Transponder ID.	December 2019
MOPAC-TB-9	LBR-TB-09	Hybrid Lane Transaction	If the same Transponder ID is not detected at all Toll	December 2019

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
		Association to a Trip Transaction	Segment, a Trip Transaction will be formed by mapping Transponder ID and license plate information from all the Lane Transactions. Transponder ID, if valid, will be associated with the trip for billing purposes.	
MOPAC-TB-10	LBR-TB-10	Trip Type Assignment Hierarchy	Once a trip is fully formed, the type of trip will be based on the following hierarchy: <ol style="list-style-type: none"> 1. Presence of Valid Tag 2. Image-Based Trip Note: all tags referenced above refer to Tolling Tags.	December 2019
MOPAC-TB-11	LBR-TB-11	Transaction Segments	If a Transaction Segment is received after the trip for which the segment belongs is built, the transaction segment will be saved and reported, but not processed.	December 2019
MOPAC-TB-12	LBR-TB-12	Trip Toll Point Duplicate	A single trip cannot contain more than one transaction for each unique Toll Point/segment within the trip.	December 2019
MOPAC-TB-13	LBR-TB-13	Consolidation of Trips	No more than a single Trip Transaction shall be sent for processing for every unique Express Lane Trip. Each Trip Transaction is unique in composition – no two trips can contain the same transaction(s).	December 2019
MOPAC-TB-14	LBR-TB-14	Trip Definitions	The Central Host shall define a set of configurable Trip Definitions which specify the various combinations of Toll Segment transactions that can be included in a single trip.	December 2019

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
MOPAC-TB-15	LBR-TB-15	Split Trips	If a customer exits the Express Lane and decides to re-enter after the configurable allowable travel time for the entire Travel Facility has passed, two separate trips shall be constructed, and the toll rate from the initial entry is considered expired. Trips are formed through the detection and inclusion of transactions at each Toll Segment in each Trip Definition. The occurrence of a transaction at Toll Segments within a given Trip Definition shall not be assumed; a valid transaction must be recorded at every Toll Point in the Trip Definition; otherwise, the transactions will form separate Trips.	December 2019
MOPAC-TB-16	LBR-TB-16	Orphan Trips	If an image-based transaction cannot be identified by Optical Character Recognition (OCR)/Manual Image Review, the transaction will form a single point trip filtered as unidentifiable.	December 2019

10.3.5 Transaction Rating Business Rules

This section describes the business rules related to the transaction rating.

Table 10-10: Transaction Rating Business Rules

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
MOPAC-TR-1	LBR-TR-01	Transaction Tag Status	Transponder status determined at the Central Host will be maintained throughout the life of the	December 2019

Old Rule	Business Rule Number	Value/Term	Condition/Rule Description	Last Update/Verification
			transaction until transmission to BOS.	
MOPAC-TR-2	LBR-TR-02	Trip Tag Status	If transponder-based trips contain transactions with both Valid and Invalid tag statuses, the Valid tag status will be applied to the trip.	December 2019
MOPAC-TR-3	LBR-TR-03	Toll Rate Assignment	The toll rate applied to a trip will be the toll rate seen by the customer at the first VTMS that applies to that trip definition, and this toll rate is locked in for the duration of the trip.	December 2019
MOPAC-TR-4	LBR-TR-04	Sign Travel time	Sign Travel time will be used to calculate the time after a rate is posted for when the rate will become effective for billing. This time is configurable, and sign based.	December 2019
MOPAC-TR-5	LBR-TR-05	Toll Rate Increase Implementation	A toll rate increase will go into effect after one of the following is met: <ol style="list-style-type: none"> 1. Two tags have been seen at both the sign tag reader and the plaza tag reader 2. Sign travel time has elapsed. 	December 2019
MOPAC-TR-6	LBR-TR-06	Rate Decrease Implementation	A toll rate decrease will go into effect immediately after the rate is posted to the sign.	December 2019
MOPAC-TR-7	LBR-TR-07	Closed Pricing	The toll rate for a closed segment will be \$0.00 (configurable).	December 2019
MOPAC-TR-8	LBR-TR-08	Open to All Pricing	The toll rate for a "FREE" segment will be \$0.00 (configurable).	December 2019



CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

**Agreement for
Electronic Toll Collection System
Integration and Maintenance Services**

Appendix 12

Data Retention Schedule

CONTENTS

12	Data Retention General Guidelines	12-1
12.1	Data Retention Guidelines General Requirements.....	12-1

LIST OF TABLES

Table 12-1:	Data Retention General Guidelines General Requirements.....	12-1
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12 DATA RETENTION GENERAL GUIDELINES

The Toll System Integrator (TSI) shall retain the different data types for the durations described below. Once the online retention period has been reached, the TSI may archive data off the system. Should CTRMA request any archived data from the TSI, it shall be produced for CTRMA within a single business day.

FE = Fiscal year-end

12.1 DATA RETENTION GUIDELINES GENERAL REQUIREMENTS

Table 12-1 provides information regarding the data retention general requirements.

Table 12-1: Data Retention General Guidelines General Requirements

Data Type	Category	Online Retention Period*	Long Term Storage Requirement
Images	Unpaid transactions	FE + 1 year	Term of contract + 120 days
Images	Paid transactions	FE + 1 years	Term of contract + 120 days
Images	Non-pursuable (code-offs, exempt, etc.)	FE + 1 years	Term of contract + 120 days
Transponder and Video-based Transaction Data	Unpaid transactions	FE + 1 year	Term of contract + 120 days
Transponder and Video-based Transaction Data	Paid transactions	FE + 1 years	Term of contract + 120 days
Transponder and Video -based Transaction Data	Non-pursuable (code-offs, exempt, etc.)	FE + 3 years	Term of contract + 120 days
DVAS Video Data	All	90 days	No long term storage required
Rate Tables	All	FE + 5 years	Term of contract + 120 days
Traffic Data	All	FE + 1 year	Term of contract + 120 days
System Logs	All	30 days	Term of contract + 120 days
MOMS Data	All	FE + 1 year	Term of contract + 120 days
Application Configuration Files	All	90 days	Term of contract + 120 days

Data Type	Category	Online Retention Period*	Long Term Storage Requirement
Tag Validation List (TVL) and License Plate Validation Lists (LVL)	All	Six months	Six months

*Online retention period not to exceed the term of the contract + 120 days.

APPENDIX B
Form of Work Authorization



CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

WORK AUTHORIZATION

**WORK AUTHORIZATION NO. XX (CTRMA-designated number)
TOLL SYSTEM IMPLEMENTATION**

ENTER FULL TOLL ROAD/PROJECT NAME HERE

THIS WORK AUTHORIZATION is made this ____ day of (enter month and year here) pursuant to the terms and conditions of (insert reference to necessary articles, attachments, general provisions, etc. of the Master Agreement/Contract here), to the original Contract for Toll System Implementation, dated (insert Master Agreement/Contract execution date here) (the Contract) entered into by and between the Central Texas Regional Mobility Authority (the “Authority” or “CTRMA”), and (insert full system integrator company name here) (the “Contractor,” also referred to in attachments to this WA No. XX as the “System Integrator” or “SI”).

PART I. The Contractor shall perform system development, implementation and integration services generally described in the Scope of Work attached hereto as Attachment A. The Contractor’s duties and responsibilities are further detailed in: (1) Project Layouts/Schematics included as Attachment B, (2) the Project Responsibility Matrix included as Attachment C, and (3) the Tolling Standards included as Attachment D.

PART II. The maximum amount payable under this WA No. XX is \$(insert CTRMA-approved project not-to-exceed budget here). This amount is based generally upon the estimated fees documented in Attachment E.

PART III. Payment to the Contractor for the services established under this WA No. XX shall be made in accordance with the Contract (insert reference to Master Contract here).

PART IV. This WA No. XX shall become effective on the date both parties have signed this WA No. XX. This WA No. XX will terminate upon the Authority’s final acceptance of the work described herein as determined by CTRMA. The work shall be performed in accordance with the project Schedule and Milestones as set forth in Attachment F.

PART V. This WA No. XX does not waive any of the parties’ responsibilities and obligations provided under the Contract, as such responsibilities and obligations under the Contract remain in full force and effect.



IN WITNESS WHEREOF, this Work Authorization No. **XX** is executed in duplicate counterparts and hereby accepted and acknowledged below.

CTRMA DIVISION DIRECTOR (*Requesting Work Authorization*)

Signature

Date

Typed/Printed Name and Title

CTRMA LEGAL (*Noting Legal Sufficiency*)

Signature

Date

Typed/Printed Name and Title

CTRMA FINANCE (*Noting Funds Availability*)

Signature

Date

Typed/Printed Name and Title

THE CONTRACTOR (insert full system integrator company name here)

Signature

Date

Typed/Printed Name and Title

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

Executed for and approved by the Central Texas Regional Mobility Authority for the purpose and effect of activating and/or carrying out the orders, established policies or work programs heretofore approved and authorized by the Texas Transportation Commission.

Signature

Date

James Bass, Executive Director

Typed/Printed Name and Title

LIST OF ATTACHMENTS

Attachment A	Work Authorization Scope of Work
Attachment B	Project Layout/Schematics
Attachment C	Project Responsibility Matrix
Attachment D	Mobility Authority Tolling Guidelines
Attachment E	System Integrator Price Sheet and Budget
Attachment F	Project Schedule & Milestone Payments
Attachment G	Project Liquidated Damages/Penalties

ATTACHMENT A

**CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
TOLL SYSTEM IMPLEMENTATION
ENTER FULL TOLL ROAD/PROJECT NAME HERE**

WORK AUTHORIZATION SCOPE OF WORK

A1.0 GENERAL

A1.01. Background

This section of the work authorization shall provide a brief description of the project to provide enough background information to understand the project history, project size, type of project, etc. Information in this section generally includes, but not limited to:

- Purpose of the project / project goals
- Location of the project (e.g. county(ies) and/or list of roads at project boundaries)
- Length of the project
- Number and types of lanes (tolled lanes and any non-tolled frontage roads)
- Description of project phases, if applicable
- How the project is being funded
- List of stakeholders and their responsibilities on the project

A1.02. Summary Scope of Work

This section of the work authorization shall provide a high-level description of the system integrator's scope of work for the project. The content captured in this section shall be reflective of the SI's proposed/final scope of work in Attachment I.

A2.0 GENERAL DESCRIPTION – PROJECT INFRASTRUCTURE

This section of the work authorization shall provide a complete description of the project infrastructure that will be constructed in support of this project. This section shall describe all infrastructure improvements for the Project, not only those within the SI's scope of work. Information in this section generally includes, but not limited to:

- Length of the project
- Number and types of lanes (tolled lanes and any non-tolled frontage roads)
- Lane widths
- List of all direct connectors, overpasses, bridges, tunnels/under-crossings, etc. to be constructed and their location
- Description of pullouts for on-road enforcement
- List of tolling points on the facility (including mainline gantry and ramps) and their locations
- List of facility entrances and exits

(insert full Project name here)

WA XX

(insert last date modified here xx/xx/xxxx)

- Description of the duct bank, including but not limited to:
 - Types, sizes and number of conduits to be used for power and fiber optic cable
 - Whether there is an existing duct bank, whether the existing duct bank will be enhanced/modified, or a new one will be added to the project
 - Use of laterals and how far they will generally be spaced
- Description of the infrastructure at toll points, including but not limited to:
 - Infrastructure at mainline and/or ramp gantries
 - Toll equipment pads
 - Power/redundant power needs
 - Maintenance pullouts/driveways
- A table containing the details for all toll point(s) on the facility, including:
 - Gantry station location on latest plan set/schematics
 - Direction of travel
 - Number of tolled lanes
 - Number of shoulders over six (6) feet in width
 - Any comments necessary for each toll point to further clarify design details

A3.0 GENERAL REQUIREMENTS - TOLL COLLECTION SYSTEM

This section of the work authorization shall outline the general requirements for the systems falling under the SI's scope of work for the Project.

A3.01 General Requirements - Toll Collection System

This section shall outline the general requirements for the toll collection system. The information in this section is not meant to be an exact reflection of the contract system requirements, but provide a general overview technologies the SI shall implement on the facility, outline integration requirements and transaction processing requirements.

Information in this section generally includes, but not limited to:

- A general statement capturing interoperability requirements of the system.
- A description of the types of technologies to be deployed on the facility, for example:
 - Automatic vehicle identification (AVI)
 - Automatic vehicle classification (ACV)/Automatic Vehicle Detection and Classification (AVDC) Hardware and type (e.g. in-ground sensor, overhead laser/scanner, etc.)
 - Image Capture System (ICS) Hardware
 - Digital video auditing system (DVAS)
 - Other technologies necessary for toll collection/operation
- A description of the Project's testing phases
- A list all required documentation for the Project

A4.0 EQUIPMENT AND INSTALLATION

A4.01. Gantries and Roadside Equipment for TCS

This section of the work authorization shall outline the equipment the SI shall be required to provide for and the Project toll collection system, as well as outline the SI's installation responsibilities.

This section generally outlines the SI's Project responsibilities related to, but not limited to:

- Procuring, storing, installing, tuning, integrating and testing all TCS hardware, including but not limited to:
 - TCS devices and components, including wiring and mounting hardware
 - Fiber optic cables, including fiber optic cable laterals and all fiber and communications required at each tolling point
 - Power cables, circuits, etc.
 - Toll equipment cabinets, with appropriate environmental and climate control
 - MOMS software for all TCS and ITS devices
 - Electrical grounding systems
 - Lightning and surge protection systems
 - Backup power systems
 - Site security systems
 - Provision of power from a Mobility Authority service point
 - Conducting radio frequency survey at each toll site, obtaining necessary Federal Communication Commissioning licensing, monitoring all licensing expiration dates and managing the process of licensing and renewals.
- Designing, documenting, developing, testing, integrating and implementing all TCS software
- Procuring, installing, integrating and testing all necessary third-party software and licenses
- Monitoring all third-party software licenses for renewals and procurement to prevent lapses in software licensing
- Testing, certification and acceptance of all systems
- Outlining responsibilities for installation of infrastructure and equipment between the SI and other Project contractors

A5.0 PROJECT COORDINATION, MANAGEMENT AND COMMUNICATION

This section of the work authorization shall provide a comprehensive list of all required coordination efforts and touchpoints with the Mobility Authority, their Project stakeholders and the SI throughout the duration of the Project.

Information in this section generally includes, but not limited to:

- A general statement noting the SI is responsible for participating in the design of the infrastructure for toll facilities.
- A general statement noting the SI is responsible for building and maintaining relationships and direct lines of communication between the Mobility Authority and other Project stakeholders as identified by the Mobility Authority.
- A detailed list of SI coordination efforts, touchpoints and responsibilities throughout the

Project, including but not limited to:

- Over-the-shoulder infrastructure design reviews
- Development of various documents and tools to communicate project status, installation requirements, or other critical aspects of the Project, including but not limited to:
 - TCS infrastructure dependency matrix
 - Installation plans and drawings
 - SI TCS schedule
- Attending various project meetings, detailing who is responsible for agendas and notes
- Participating in the development of a Master Project schedule
- Coordinating infrastructure changes during design and/or construction
- Coordinating the development of a process to formally review, validate and accept constructed infrastructure at TCS sites
- Communicating requirements needed from Mobility Authority and Project stakeholders for system testing

A6.0 WORK BY OTHERS

This section of the work authorization shall outline the civil design and construction activities that are *not* the responsibility of the SI.

Information in this section generally includes, but not limited to:

- SI responsibilities regarding infrastructure design
- SI communication and relationship responsibilities with the Mobility Authority and other Project stakeholders as identified by the Mobility Authority
- A list of SI coordination efforts, touchpoints and responsibilities throughout the Project, including but not limited to:
 - Over-the-shoulder review participation
 - Development of various documents and tools to communicate project status, installation requirements, or other critical aspects of the Project, including but not limited to:
 - TCS infrastructure dependency matrix
 - Installation plans and drawings
 - SI TCS schedule
 - Attending various project meetings
 - Participating in the development of a Master Project schedule
 - Coordinating infrastructure changes during design and/or construction
 - Coordinating the development of a process to formally review, validate and accept constructed infrastructure at TCS sites
 - Communicating requirements needed from Mobility Authority and Project stakeholders for system testing

A7.0 TOLL FACILITIES RESPONSIBILITY MATRIX

This section shall refer to the SI to the Project responsibility matrix to provide a detailed delineation of responsibilities between the Project Contractor(s) and the SI.

A8.0 MASTER PROJECT CONSTRUCTION SCHEDULE

This section shall refer to the SI to the Project schedule in its current form.

[END OF SECTION]

SAMPLE

ATTACHMENT B

Project Layout

ENTER FULL TOLL ROAD/PROJECT NAME HERE

This attachment shall contain visuals of the proposed project layout. Project layouts shall be included in their current form and may be subject to change.

SAMPLE

ATTACHMENT C

Project Responsibility Matrix **ENTER FULL TOLL ROAD/PROJECT NAME HERE**

This attachment shall contain the Project's responsibility matrix delineating responsibility between the SI and other Project Contractor(s). The responsibility matrix may vary by Project. See the example below for a Project Responsibility Matrix from a prior work authorization:

SAMPLE

Responsibility Assignment Legend							
Primary Responsibility: P		Support Responsibility: S		Coordination Responsibility Only: C			No Responsibility: N
Element/Task/Component/ Sub-system	Designer	Contractor		Systems Integrator (SI)			Comments Other Responsibility/Information
	Design	Procure	Install/ Construct	Design	Procure	Install / Construct	

GENERAL REQUIREMENTS							
Schedule	N	P	P	S	S	S	Contractor must accommodate and incorporate the SI scheduled activities into the project schedule. All schedule changes or updates which impact the SI tasks must be agreed to by the SI prior to submittal to CTRMA. A weekly schedule must be distributed and incorporate any SI updates or changes.
Request for Early Opening	N	P	P	S	S	S	The SI must be able to match schedule request for early opening. SI must be allowed early unencumbered access in order to meet early opening request.
Design Package – Installation and Electrical Design and Plans	P	P	P	C	N	C	Designer to incorporate all SI requirements and specifications into Structural and Electrical Design Packages. Contractor will coordinate installation activities with SI.
Grading	N	P	P	C	N	C	
Drainage		S	P	C	N	C	No culverts or pipes under tolling zones.
Utilities/Electrical Services	P	P	P	S	C	C	SI to provide specific power requirements for the Toll System to the Contactor. The contractor is to incorporate the toll facilities design and construct power utilities interface, and all power infrastructure. Contractor to provide power to the Toll System pad and ITS locations. SI to terminate power to their sites.”
Traffic Control/Safe work zone	N	P	P	S	N	C	SI to provide contractor detailed lane closure requirements and schedule for installation and testing.
Signing	N	P	P	C	N	S	All toll signing must be coordinated with and approved by CTRMA.
Striping	N	P	P	S	N	C	SI to coordinate striping with pavement loop locations. Contractor to coordinate with SI for loops installation and striping sequencing.
Lighting		P	P	S	C	S	Roadway and toll location lighting provided by contractor. SI to provide lighting requirements

(insert full Project name here)

WA XX

(insert last date modified here xx/xx/xxxx)

Responsibility Assignment Legend							
Primary Responsibility: P	Support Responsibility: S			Coordination Responsibility Only: C			No Responsibility: N
Element/Task/Component/ Sub-system	Designer	Contractor		Systems Integrator (SI)			Comments Other Responsibility/Information
	Design	Procure	Install/ Construct	Design	Procure	Install / Construct	
							in vicinity of toll locations and locations of other Toll System equipment. Contractor to confirm that lighting does not obstruct toll related signing or impede the Toll System.
TOLL SYSTEM: LOCATIONS, LAYOUTS, STRUCTURES, MOUNTS/BRACKETS							
Locations and Layouts	P	P	P	S	C	C	SI to provide specific locations for the Toll System. SI to provide requirements for specific lane and facility layouts. Designer to incorporate into Design Packages. The contractor will coordinate with SI during the installation activity.
Gantries/Foundation/Trusses/Junction boxes/Conduits/Grounding	P	P	P	S	C	S	SI to provide requirements for conduits (for SI installed power and communications cables, including specific requirement for below ground conduits for the loops), junction boxes, and power needs for the Toll System. The Designer to incorporate into structural design, including electrical grounding, bonding. Contractor to provide and install junction boxes and conduit pull strings and bell ends for all conduits up to one foot above pole and gantry foundation. The contractor will require SI to sign off on below ground conduits for the loops prior to installation of special pavement structure.
Gantries/Foundation/Trusses/Junction boxes/Conduits/Grounding	N	P	P	S	C	S	Contractor will provide conduits/wire ways on all the toll gantries for all the SI equipment.
EQUIPMENT CABINETS							
Automatic Vehicle Classification and Detection (AVC) and (AVD)	N	N	S	P	P	P	SI to install, connect and terminate AVC and/or AVD System mounted on the gantries and/or installed in the pavement to the electronics in the cabinets.
COMMUNICATIONS SUB-SYSTEMS							
DUCT BANK AND INTELLIGENT TRANSPORTATION SYSTEMS (ITS)							

(insert full Project name here)

WA XX

(insert last date modified here xx/xx/xxxx)

Responsibility Assignment Legend							
Primary Responsibility: P	Support Responsibility: S		Coordination Responsibility Only: C			No Responsibility: N	
Element/Task/Component/ Sub-system	Designer	Contractor		Systems Integrator (SI)			Comments Other Responsibility/Information
	Design	Procure	Install/ Construct	Design	Procure	Install / Construct	
New Duct bank	P	P	P	C	C	C	SI to provide requirements for new duct bank. Designer to incorporate into roadway design. SI to confirm that design plans meet requirements.
Fiber Installation	N	C	C	P	P	P	SI to provide, install and test the fiber.

ATTACHMENT D

Mobility Authority Tolling Standards

ENTER FULL TOLL ROAD/PROJECT NAME HERE

This attachment shall contain the Mobility Authority's current tolling standards. Tolling standards may change based on the SI's review.

SAMPLE

ATTACHMENT E

System Integrator Price Sheet

ENTER FULL TOLL ROAD/PROJECT NAME HERE

This attachment shall contain the detailed pricing sheet(s) as agreed to by the SI and the Mobility Authority.

Note: Because each Mobility Authority project will be different, each price sheet should contain the labor positions, their associated estimated hours, and associated hourly rates the SI used to develop the Project Price Sheet, noting any proposed or annual contract rate escalation percentage. Additionally, the SI shall provide a detailed breakdown of project cost estimates for, but not limited to, the following:

- TCS Equipment costs
- Program management costs
- Software design costs
- Software development costs
- Software testing costs
- Project documentation costs, broken out by each document required for the Project
- TCS installation costs
- Bonding costs

The pricing sheet shall also note any assumptions the SI made while developing the project pricing, as well as a detail list of items/activities not included in the project pricing.

ATTACHMENT F

Project Schedule & Milestone Payments

ENTER FULL TOLL ROAD/PROJECT NAME HERE

This Attachment shall contain the project milestone payment schedule.

Because each Mobility Authority project will be different, Project Milestone Payment Schedules may vary from project to project. The following examples represent Milestone Payment Schedules for three (3) phases of work:

- Phase 1: Initial implementation of the toll host, first facility transition/installation and delivery of all program-level documentation.
- Phase 2: Includes transitioned or new facility after the toll host has been developed and deployed, project-specific documentation, and any program documentation requiring updates for the project.
- Phase 3: Includes transitioned facilities after the toll host has been developed and deployed, project-specific documentation, and any program documentation requiring updates for the project.

Refer to the Scope of Work in the RFP for example Milestone Payment tables.

ATTACHMENT G

Project Liquidated Damages/Penalties

ENTER FULL TOLL ROAD/PROJECT NAME HERE

This attachment shall contain the Project liquidated damages and associated assessments.

Because each Mobility Authority project will be different, Project Liquidated Damages may vary from project to project. Liquidated Damages and associated assessments shall be agreed upon between the SI and the Mobility Authority, but shall generally be associated with:

- Not beginning work within 30 days of receiving NTP from the Mobility Authority
- Depending on the “phase” or type of project, each project schedule milestone, for example:
 - Approval of system design (including design documents, RTM, BOM)
 - Approval of installation plan and drawings
 - Approval of training, user and maintenance manuals
 - Approval of Factory Acceptance Testing
 - Approval of OFIT/1st Tolling Location Commissioning
 - Approval of Commissioning for All tolling locations
 - Go-live for all tolling locations
 - All ITS available for 1st toll location go-live
 - Approval of Operational Acceptance Testing

ATTACHMENT H

Master Project Schedule and Milestones

ENTER FULL TOLL ROAD/PROJECT NAME HERE

This attachment shall contain the Master Project Construction Schedule in its current form. This schedule may change after approval of the Work Authorization.

SAMPLE

ATTACHMENT I

System Integrator Proposed Scope of Work

ENTER FULL TOLL ROAD/PROJECT NAME HERE

This attachment shall contain the SI's detailed scope of work.

Note: The format, contents and general makeup of the detailed scope of work shall be developed and mutually agreed upon by the selected Proposer and the Mobility Authority after execution of contract.

SAMPLE

APPENDIX C
Installation Services Unit Prices

**Appendix C
Installation Services Unit Prices**

SECTION / LINE		DESCRIPTION	UNIT	PROPOSED QTY	UNIT PRICE	APPLICABLE PRICE ADJUSTMENT INDICES ³		TOTAL PRICE
						CPI-U	WPU 117	
A	1	Mobilization						
	2	Mobilization (5% of B Subtotal)	Lump Sum	1	N/A	100%	0%	\$ 1,332,925.93
	3	Subtotal – Mobilization \$ 1,332,925.93						
B	4	System Procurement and Installation (includes: materials, software, equipment, labor, traffic control, and integration)						
B1-A	5-A	Open Road Toll Collection² – Existing Facilities/System Replacement w/ In-Ground AVD/C (including all Toll Zone equipment and roadside controller appurtenances and DVAS) ¹						
	6-A	One lane (no shoulder)	Each	5	\$ 127,349.66	50%	50%	\$ 636,748.31
	7-A	One lane + one shoulder	Each	6	\$ 177,967.80	50%	50%	\$ 1,067,806.82
	8-A	One lane + two shoulders	Each	0	\$ 254,764.41	50%	50%	\$ -
	9-A	Two lanes (no shoulder)	Each	0	\$ 207,513.30	50%	50%	\$ -
	10-A	Two lanes + one shoulder	Each	2	\$ 247,726.50	50%	50%	\$ 495,453.01
	11-A	Two lanes + two shoulders	Each	2	\$ 326,309.50	50%	50%	\$ 652,619.00
	12-A	Three lanes + two shoulders	Each	6	\$ 386,132.25	50%	50%	\$ 2,316,793.52
	13-A	Four lanes + two shoulders	Each	0	\$ 461,635.52	50%	50%	\$ -
	14-A	Five lanes + one shoulder	Each	0	\$ 522,246.69	50%	50%	\$ -
	15-A	Five lanes + two shoulders	Each	0	\$ 579,862.49	50%	50%	\$ -
B1-B	5-B	Open Road Toll Collection² – Existing Facilities/System Replacement w/ In-Ground and Supplemental Above Ground AVD/C (including all Toll Zone equipment and roadside controller appurtenances and DVAS) ¹						
	6-B	One lane (no shoulder)	Each	2	\$ 155,451.63	50%	50%	\$ 310,903.27
	7-B	One lane + one shoulder	Each	6	\$ 223,699.81	50%	50%	\$ 1,342,198.86
	8-B	One lane + two shoulders	Each	1	\$ 298,330.86	50%	50%	\$ 298,330.86
	9-B	Two lanes (no shoulder)	Each	3	\$ 239,424.73	50%	50%	\$ 718,274.19
	10-B	Two lanes + one shoulder	Each	5	\$ 320,014.69	50%	50%	\$ 1,600,073.45
	11-B	Two lanes + two shoulders	Each	0	\$ 437,079.80	50%	50%	\$ -
	12-B	Three lanes + two shoulders	Each	4	\$ 486,746.31	50%	50%	\$ 1,946,985.24
	13-B	Four lanes + two shoulders	Each	2	\$ 559,344.69	50%	50%	\$ 1,118,689.39
	14-B	Five lanes + one shoulder	Each	1	\$ 638,518.94	50%	50%	\$ 638,518.94
	15-B	Five lanes + two shoulders	Each	1	\$ 716,149.36	50%	50%	\$ 716,149.36
B2	16	Open Road Toll Collection – Future Facilities/New Construction w/ In-Ground AVD/C (including all Toll Zone equipment and roadside controller appurtenances and DVAS) ¹						
	17	One lane (no shoulder)	Each	0	\$ 128,899.45	50%	50%	\$ -
	18	One lane + one shoulder	Each	10	\$ 180,436.89	50%	50%	\$ 1,804,368.88
	19	Two lanes (no shoulder)	Each	0	\$ 209,964.20	50%	50%	\$ -
	20	Two lanes + one shoulder	Each	1	\$ 261,999.82	50%	50%	\$ 261,999.82
	21	Two lanes + two shoulders	Each	8	\$ 321,423.41	50%	50%	\$ 2,571,387.31
	22	Three lanes + two shoulders	Each	4	\$ 393,449.56	50%	50%	\$ 1,573,798.22
	23	Four lanes + two shoulders	Each	0	\$ 484,691.58	50%	50%	\$ -
B3	24	Toll Facility Host (including Systems and Subsystems (i.e. dynamic pricing, image review, trip building, etc.))						
	25	Toll Facility Host	Each	1	\$ 1,573,944.79	50%	50%	\$ 1,573,944.79
	26	Key Reports	Lump Sum	1	\$ 128,842.11	50%	50%	\$ 128,842.11
B4	27	Plaza Server						
	28	Plaza Server	Each	10	\$ 13,901.34	50%	50%	\$ 139,013.36
B5	29	ORT Roadside Equipment Cabinet						
	30	Toll Zone	Each	69	\$ 8,331.93	50%	50%	\$ 574,903.26
B6	31	Dynamic Pricing						
	32	Variable Toll Message Sign Components, associated CCTV, & Cabinet	Each	30	\$ 36,020.59	50%	50%	\$ 1,080,617.68
	33	Traffic Speed, Volume, and Density Detection Site w/Cabinet	Each	50	\$ 9,365.72	50%	50%	\$ 468,285.94
B7	34	Communication and Conduit						
	35	Communications Subsystem (includes: network switches, patch panels, installation, connections, and integration between communications demarcation and roadside cabinets)	Each	69	\$ 7,190.73	50%	50%	\$ 496,160.63
	36	Fiber optic communication cable (12-strand single-mode, additional footage up to 1 mile)	Feet	5280	\$ 14.46	50%	50%	\$ 76,325.04

**Appendix C
Installation Services Unit Prices**

SECTION / LINE	DESCRIPTION	UNIT	PROPOSED QTY	UNIT PRICE	APPLICABLE PRICE ADJUSTMENT INDICES ³		TOTAL PRICE	
					CPI-U	WPU 117		
	37	Copper/CAT-6 communication cable (additional footage up to 1 mile)	Feet	5280	\$ 9.32	50%	50%	\$ 49,219.10
	38	Rigid Metal (4") Conduit (additional footage up to 1 mile)	Feet	5280	\$ 73.22	50%	50%	\$ 386,626.94
	39	PVC Conduit (2", trenched, additional footage up to 1 mile)	Feet	5280	\$ 19.40	50%	50%	\$ 102,421.97
B8	40	Emergency Power and Back-up						
	41	Uninterruptible Power Supply	Each	69	\$ 8,410.28	50%	50%	\$ 580,309.02
	42	Emergency Generator (permanently installed)	Each	51	\$ 18,098.44	50%	50%	\$ 923,020.29
	43	Temporary/Portable Generator	Each	2	\$ 3,865.05	50%	50%	\$ 7,730.11
	44	Subtotal – System Procurement, Installation, and Testing (B1 - B8)						\$ 26,658,518.66
C	45	Project Management and Testing Services						
	46	Project Management	Month	72	\$ 57,078.32	100%	0%	\$ 4,109,639.18
	47	Project Documentation (Program-Level Master Documents)	Each	1	\$ 834,154.42	100%	0%	\$ 834,154.42
	48	Project Documentation (Project-Level Standalone Documents)	Each	10	\$ 46,030.18	100%	0%	\$ 460,301.77
	49	Project Documentation (Program-Level Master Document Updates)	Each	10	\$ 13,583.59	100%	0%	\$ 135,835.86
	50	System Design	Each	1	\$ 1,309,580.44	100%	0%	\$ 1,309,580.44
	51	Factory Acceptance Test for Transition Phase 1 (Initial Host & Roadside)	Each	1	\$ 1,082,213.77	100%	0%	\$ 1,082,213.77
	52	Factory Acceptance Tests for Transition Phase 2 (Host & Roadside)	Each	10	\$ 151,585.79	100%	0%	\$ 1,515,857.89
	53	Configuration of Toll Facility Host (ORT Facilities)	Each	7	\$ 46,724.48	100%	0%	\$ 327,071.35
	54	Configuration of Toll Facility Host (Managed Lanes Facilities)	Each	3	\$ 89,046.19	100%	0%	\$ 267,138.58
	55	Site Installation Test (ORT and Managed Lanes Facilities)	Toll Zone	69	\$ 1,210.48	100%	0%	\$ 83,523.38
	56	Integration Test (ORT Facilities)	Toll Zone	53	\$ 18,062.85	100%	0%	\$ 957,331.01
	57	Integration Test (Managed Lanes Facilities)	Toll Zone	16	\$ 12,390.98	100%	0%	\$ 198,255.76
	58	Operational Acceptance Test (ORT Facilities)	Toll Zone	53	\$ 22,458.48	100%	0%	\$ 1,190,299.43
	59	Operational Acceptance Test (Managed Lanes Facilities)	Toll Zone	16	\$ 28,095.52	100%	0%	\$ 449,528.25
	60	Final Operational Acceptance Test (All Facilities)	Each	1	\$ 91,662.05	100%	0%	\$ 91,662.05
	61	System As-Builts	Each	10	\$ 4,607.15	100%	0%	\$ 46,071.50
	62	Subtotal – Project Management and Testing Services						\$ 13,058,464.65
	63	Grand Total – Installation Services (Sections A, B and C)						\$ 41,049,909.24
D	64	Installation Services Optional to CTRMA						
	65	Transaction Aggregation	Lump Sum	1	\$ 48,041.42	100%	0%	\$ 48,041.42
	66	Total – Installation Services Optional to CTRMA						\$ 48,041.42

NOTES:

Installation Services Pricing does not include potential future ITS Services described in Section 2.20 of Appendix 2, Scope of Work.

¹ Shoulders shall be fully instrumented as a lane for purposes of pricing in this section.

² Pricing for Existing Facilities includes no re-use of equipment.

³ Indicates the percentage of the Unit Price that will be adjusted by either the applicable CPI-U or WPU 117, in accordance with Section 2.1.e of the Agreement.

APPENDIX D
Maintenance Services Unit Prices

**Appendix D
Maintenance Services Unit Prices**

SECTION / LINE	DESCRIPTION	UNIT	PROPOSED QTY	UNIT PRICE	APPLICABLE PRICE ADJUSTMENT INDICES ³		TOTAL PRICE	
					CPI-U	WPU 117		
E	1	System Maintenance (includes: all materials, software, equipment, labor, traffic control, FON and network administration and maintenance, etc. required to maintain the ETCS in accordance with the SLAs)						
	2	Toll Zone Maintenance for ORT facilities including emergency power and backup, per lane	Month	8256	\$ 1,672.07	90%	10%	\$ 13,804,649.55
	3	Toll Zone Maintenance for managed lanes facilities, per lane	Month	2256	\$ 1,875.21	90%	10%	\$ 4,230,468.80
	4	Variable Toll Message Signs and associated CCTV, per sign	Month	1440	\$ 405.64	90%	10%	\$ 584,120.30
	5	Radar or Microwave Traffic Speed, Volume, and Density Detection Equipment, per device	Month	2400	\$ 392.80	90%	10%	\$ 942,716.16
	6	Total – System Maintenance						\$ 19,561,954.81
F1	7	System Maintenance - Image Review (Combined Automated and Manual Review)²						
	8	Year-1	Transaction ²	169,499,000	\$ 0.0109	90%	10%	\$ 1,847,539.10
	9	Year-2	Transaction ²	183,040,000	\$ 0.0098	90%	10%	\$ 1,793,792.00
	10	Year-3	Transaction ²	202,260,000	\$ 0.0099	90%	10%	\$ 2,002,374.00
	11	Year-4	Transaction ²	217,394,000	\$ 0.0101	90%	10%	\$ 2,195,679.40
	12	Year-5	Transaction ²	232,681,000	\$ 0.0103	90%	10%	\$ 2,396,614.30
	13	Total – System Maintenance: Image Review						\$ 10,235,998.80
F2	14	System Maintenance - Unit Price for Image Review² (informational only, not used for scoring or payment purposes)						
	15	Manual Image Review Unit Price	Transaction ²		\$ 0.0344			
	16	Automated Image Review Unit Price	Transaction ²		\$ 0.0100			
G	17	System Maintenance - TIM Center Operations						
	18	Traffic and Incident Management Center Supervisor	Month	48	\$ 16,893.83	90%	10%	\$ 810,903.70
	19	Traffic and Incident Management Center Operator	Month	96	\$ 7,982.63	90%	10%	\$ 766,332.71
	20	Total – TIM Center Operations						\$ 1,577,236.41
	21	Grand Total – Maintenance Services						\$ 31,375,190.02

NOTES:

Maintenance Services Pricing does not include potential future ITS Services described in Section 2.20 of Appendix 2, Scope of Work.

¹ Image review pricing by volume ranges, based on pricing categories.

² The image review pricing shall be per transaction, regardless of the number of images associated with the transactions.

³ Indicates the percentage of the Unit Price that will be adjusted by either the applicable CPI-U or WPU 117, in accordance with Section 2.1.e of the Agreement.

APPENDIX E
Labor Rates

APPENDIX F
Service Level Agreements



CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

**Agreement for
Electronic Toll Collection System
Integration and Maintenance Services**

Appendix 7

Service Level Agreement

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7 SERVICE LEVEL AGREEMENT (SLA)

7.1 GENERAL PROVISIONS

The TSI shall meet defined levels of performance in the execution of the Scope of Work. This Appendix 7 describes the minimum performance requirements the TSI must meet. The TSI is responsible for demonstrating that the performance requirements of the RFP and, as otherwise described herein, can be met or exceeded before Final System Acceptance. The measurement of these service level SLAs shall be automated where possible and shall be straightforward and data-driven, as agreed to by the TSI and CTRMA. CTRMA, at their discretion, will periodically audit the reported results.

The TSI shall develop reports that compare actual results to the requirements defined in this appendix and shall submit these reports to CTRMA within ten (10) business days of each month-end. The TSI shall maintain all corresponding data in compliance with the data retention policies outlined in the RFP, and the data shall be made available to CTRMA upon request. The methods and results of the measurement process shall be fully subject to independent audit. They shall be utilized by the TSI to take corrective action to correct any deficiencies and failures to meet the required availability, accuracy, and performance requirements. The TSI shall be subject to liquidated damages as described in the SLA table for failure to provide the required reports within the specified timeframe or if reports are not accurate or complete.

Actual performance shall be defined and measured against the requirements and time periods in the SLA table to assess the availability, accuracy, and performance of the delivered system. This appendix addresses these requirements for the following levels of service:

1. Accuracy
2. Availability
3. System performance
4. Maintenance (Response/Repair timing)

The sections below provide general conditions that apply to the SLAs described herein. Should a specific SLA section define terms or conditions which appear contrary to these general provisions, the terms or conditions within the specific SLA section take precedence.

7.2 KEY PERFORMANCE REQUIREMENTS

7.2.1 Availability Requirements

The Availability requirements, as specified in the SLA table, shall be measured during the Operations Acceptance Test and monthly thereafter. The availability requirements will not include approved scheduled preventive maintenance activities.

These requirements shall be initially applied at the start of the warranty phase. The warranty phase shall conclude after twelve (12) months upon successful completion of the Operational Acceptance Test **and** full project acceptance of each project/facility, as described in Section

2.13.6 of the RFP. Once CTRMA has certified systems acceptance **and** upon expiration of the warranty phase for a system or roadway, dependent on the transition schedule, that roadway or system shall transition to the maintenance phase. The monthly warranty fee or maintenance fee, as applicable, shall be subject to the monthly assessment of availability and reliability measurement, as well as other criteria as outlined in the SLA table, and applicable damages for failure to meet such criteria.

7.2.2 Performance Reviews

CTRMA will review the TSI's performance monthly, using required system reports provided by the TSI, including reports generated and created by MOMS. Performance reviews shall begin one (1) month after commencement of the warranty phase and shall include evaluation of the previous month of operation. CTRMA may elect to waive or impose damages during the first four (4) months of the warranty phase.

The availability calculation will not include downtime during any period when CTRMA does not allow the TSI to close a lane or otherwise work along the roadway unless such failure to approve is the result of the TSI not following the CTRMA procedures in making the request.

7.2.3 Chargeable and Non-Chargeable Failures

For purposes of calculating availability performance requirements for testing and maintenance performance chargeable and non-chargeable failures are defined as follows:

7.2.3.1 Chargeable Failures

Chargeable failures include any failures that are not specifically identified as non-chargeable in Section 7.2.3.2, including but not limited to:

1. A malfunction that prevents the ETCS (hardware or software) from performing its designated function, when used and operated under its intended operational and environmental conditions as detailed in the Scope of Work.
2. A malfunction that poses a threat to the safety of the ETCS components, customers, employees, or others.
3. An occurrence where data is not successfully transmitted between the toll zone locations and the TFH unless the failure is already accounted for as a separate performance failure. For example, if the zone controller is not functioning and does not transmit data to the TFH, the zone would be charged for the failure, but the system would not.
4. Any failure of equipment or software that allows revenue loss to occur on the ETCS that is not already accounted for as a separate performance failure.
5. Significant software anomalies and bugs that affect the performance and operation of the ETCS.
6. Shutdown or unavailability of a toll zone locations and the TFH unless specifically directed.
7. Failure to properly register or transmit a transaction record from a toll zone location and the TFH.
8. Failure to accurately reconcile the ETCS.

9. Failure to transmit a transaction's correct toll amount to the CTRMA Data Platform System.
10. Failure to transmit the correct toll amounts to the CTRMA Data Platform System within the required time.
11. Loss of data either at the lane or TFH level, including failure to meet data retention requirements.
12. Failure to electronically send or receive transaction information.
13. Failure to generate the reports required to reconcile and audit the system.

7.2.3.2 Non-Chargeable Failures

Non-chargeable failures include any failures that are not specifically identified as chargeable in section 7.2.3.1, including but not limited to:

1. Force Majeure Event, as defined in the contract
2. Vandalism
3. System component failures caused by environmental or operating conditions outside the design standards of the equipment
4. Failures that are customer, customer representative, or user induced

7.2.4 Accuracy Requirements

Accuracy requirements are specified in the SLA Table.

7.2.5 Time Constraint Requirements

Time Constraint requirements are specified in the SLA Table.

7.2.6 Maintenance Service Level Requirements

The TSI shall provide sufficient personnel, tools, and other necessary resources to meet the service level requirements defined in the SLA Table.

7.2.6.1 Maintenance Support Requirements

Maintenance response time shall be measured from the time the system generates an alert/ticket, the TSI is notified a priority event has occurred and/or a failure event has occurred, whichever occurs first, and ends when the TSI acknowledges the alert, ticket and/or event via an approved communication method (e.g. MOMS).

Repair time shall be measured from the time the TSI acknowledges the ticket for the event and ends when the failure condition is corrected, and the system is returned to regular operation. If access to the equipment in question is denied to the TSI based on the CTRMA policy, the repair time shall be measured beginning when CTRMA has allowed the TSI access to the equipment.

Both the response time and the repair time shall be registered in the MOMS. Failure to meet the required response and repair times shall be monitored through MOMS reports.

7.2.6.2 Routine Maintenance Activities Requirements

The TSI shall perform routine maintenance activities per the approved maintenance schedule.

7.2.6.3 Stop Clock Conditions

The TSI may be excused from its obligation to meet the performance and service level requirements set forth above under certain conditions that shall be referred to as “Stop Clock Conditions.” Only the time during which such conditions are present shall be excluded from the timeframes used to measure the TSI’s performance as set forth below:

The TSI will exclude from its availability calculations the time arising from any of the following “Stop Clock Conditions”:

1. Loss of connectivity to all the CTRMA provisioned roadside Hub buildings if a third party causes the loss of connectivity to all Hubs, not under the direct or indirect control of the TSI and not reasonably preventable by the TSI, including, but not limited to, fiber cuts not caused by the TSI. For purposes of this provision, the TSI’s employees, affiliates, subsidiaries, data services providers, agents, suppliers, or subcontractors shall be deemed to be under the control of the TSI concerning the equipment, services, or facilities to be provided under this Agreement.
2. The following CTRMA contact/access problems, provided that the TSI makes reasonable efforts to contact the CTRMA approved contacts immediately upon the commencement of the Stop Clock period:
 - a. Access necessary to correct the problem at a CTRMA owned site is not available because access is improperly denied or not arranged by the site contact or the CTRMA representative, provided that the TSI properly scheduled the visit or access beforehand, if advance notice was required.
 - b. The CTRMA construction activities that prevent the TSI from performing scheduled maintenance or repair of in-lane equipment or systems.
 - c. Incorrect site contact information, which prevents access, provided that the TSI takes reasonable steps to notify the CTRMA approved contacts of the improper contact information immediately and takes reasonable steps to obtain the correct information.
3. Routine Scheduled Maintenance provided such schedule was provided to and approved by CTRMA in advance and in writing; provided, however, that in no event shall the Stop Clock Condition time period be extended beyond the standard routine scheduled maintenance time period.
4. Force majeure events.

The TSI shall be required to submit “Stop Clock Documentation” for each use of a Stop Clock Condition. The TSI shall submit documentation to CTRMA as soon as the TSI is aware of a Stop Clock Condition occurring. Failure to provide CTRMA with written notice when a “stop work” event arises waives the TSI’s right to seek Stop Clock Conditions. All Stop Clock Documentation must be included in the TSI’s Monthly Report. CTRMA may evaluate all Stop Clock Documentation and may request additional justification for each Stop Clock Condition. At the discretion of CTRMA, use of Stop Clock Conditions may be rejected, conditionally accepted, or accepted on a case-by-case basis. The TSI shall coordinate with CTRMA to define all processes related to Stop Clock Conditions, notification thereof, documentation requirements and other

processes as necessary, and document those processes in the TSI's Maintenance Plan submitted for CTRMA's review and approval.

If it is determined during the review of a monthly maintenance invoice that the cause of the problem was not the fault or responsibility of CTRMA, or in the event of denied access, if the reason was determined to be proper, then the Stop Clock Condition shall not apply. Further, if it is determined that the cause of the problem was not the fault or responsibility of CTRMA, or in the event of denied access, if the reason was determined to be proper, **after** CTRMA has paid the TSI the monthly maintenance amount for the month in question, CTRMA shall be able to deduct any penalties that should have applied from a future monthly maintenance payment amount.

Notwithstanding any other provision of the contract documents to the contrary, the following Stop Clock Conditions do not apply to:

1. The TSI's response time performance requirements as outlined in the RFP generally and Appendix 7 specifically.
2. Testing or maintenance initiated by the TSI outside of routine scheduled maintenance windows.
3. Power fluctuations caused by electrical utility providers, common carriers, the TSI, the TSI affiliates, subsidiaries, data services providers, or subcontractors.
4. Time period during which CTRMA has made reasonable efforts to notify the TSI of a problem, but the TSI was not available or reachable.
5. Failure of the TSI to provide adequate facilities (including cabinets, sunshields, etc.) to ensure delivery of the contracted services will not be considered a valid stop clock condition to the extent such failure of the TSI contributed to the stop clock condition.
6. Any other reason or cause not expressly listed above for which the TSI is responsible.
7. If the TSI asserts force majeure or failure of the CTRMA provided equipment as an excuse to performance, the TSI shall have the burden of (i) proving sole proximate cause to the satisfaction of CTRMA, (ii) that the TSI took reasonable steps to minimize the delay and damages caused by events when known or should have been known, and (iii) that the TSI timely notified CTRMA of the actual occurrence which is claimed as grounds for a defense under this clause (if any).

7.2.6.4 Help Desk Support Requirements

The TSI shall supply personnel with expertise in support of the system hardware, software, and database management system(s) during the CTRMA working hours (to be determined during the system design phase) to provide a help desk function for all TSI-supplied systems and subsystems. The help desk is intended to act as a central point of contact for all technical support, including hardware and software questions, installation of updated versions of software, networking, network connection requests, and troubleshooting.

7.2.7 Miscellaneous

7.2.7.1 Single Event Causing Cumulative Liquidated Damages

If the TSI can prove to the reasonable satisfaction of CTRMA that a single event causes the TSI to fail to meet more than one SLA, cumulative liquidated damages shall not be imposed. Instead, the highest applicable liquidated damages relative to such occurrence shall apply.

If the TSI fails to complete the repair according to the service levels outlined in the SLAs, then the TSI shall, in addition to the liquidated damages assessed for the single event, will be responsible for liquidated damages resulting from not meeting the repair time service levels for the affected systems.

7.2.7.2 Calculation of Damages

To calculate liquidated damages, all timeframes stated in the Damages column of the following chart shall be the time stated or any portion thereof. By way of example and not by limitation, if in SLA AC2, the Automatic Vehicle Classification results in a score of 99.47, failing to meet the required 99.75% SLA by 0.28%, for one toll zone, then the liquidated damages assessed for failure to meet this SLA will be 1% + 1% + 1% (3%) of the monthly maintenance fee. The examples below assume a monthly maintenance fee of \$100,000 for illustrative purposes.

Table 7-1: Calculation of Damages

SLA	Result	Difference	Penalty	Sample Calculated Damage
99.90%	99.62%	0.3 below required SLA	Every 0.1% below the SLA damages of 1% of the monthly maintenance fee.	Monthly Maintenance fee X (1% + 1% + 1%) or 3% x \$100,000 = \$3,000
99.99%	99.75%	0.2 below required SLA	Every 0.1% below the SLA damages of 2% of the monthly maintenance fee.	Monthly Maintenance fee x (2% + 2%) or 4% x \$100,000 = \$4,000
98.00%	97.86%	0.1 below required SLA	Every 0.1% below the SLA damages of 5% of the monthly maintenance fee.	Monthly Maintenance fee .05% x \$100,000 = \$5,000
99.50%	99.44	0.1 below required SLA	\$200 per each 0.1% below threshold	\$200
3hrs	> 3 hrs. 1 min to <= 3 hrs. 20 min	20 min	\$300 for every 20 minutes beyond the SLA per event.	\$300
3hrs	> 3 hrs. 20 min to <= 3 hrs. 40 min	40 min	\$300 for every 20 minutes beyond the SLA per event.	\$600

Formulas for measuring each SLA have been provided for each SLA description below. While a measurement formula is provided, the TSI shall coordinate with CTRMA to review, finalize and agree upon all measurement formulas prior to execution of the Contract. The TSI shall document each approved, agreed upon measurement method within their Maintenance Plan

for CTRMA's review and approval. The TSI shall be responsible for updating their Maintenance Plan to reflect the most current version of the measurement formulas should CTRMA request or agree to modify any formula in the future.

7.2.7.3 Calculation of Damages for Consecutive Failures

Recurring and consecutive failure to comply with the SLAs provided in this Agreement will result in substantial harm to CTRMA, but damages from such harm are difficult to quantify. Damages will increase for prolonged periods, and therefore for any SLA that is missed for three consecutive months, the liquidated damages will be doubled for each subsequent month where the SLA is missed. The liquidated damages will revert to the original value upon the SLA being met for a month.

SLA ID	SLA Name	Key Performance Indicator Description	Service Level Agreement	Damages	Measurement Requirement									
Accuracy														
AC1 – AC4 applies to all vehicles, traveling through a toll zone that are separated from other vehicles in the same travel lane, at speeds from stop-and-go to 100 mph.														
AC1 – AC4 are measured for each gantry location by direction .														
AC1	Automatic Vehicle Detection	<p>Each vehicle passing through a gantry location will be detected/reported once, and only once (no exception made for degradation or loss in the availability of the AVC), including vehicles in the shoulders and straddling the lane and shoulder.</p> <p>The TSI will reconcile failed performance from the audits within 30 calendar days.</p>	99.80% with an 80% Confidence Level	For each gantry location by direction, every 0.1% below the SLA, the TSI shall be subject to liquidated damages in the amount of 1% of the monthly maintenance fee.	<p>Each month, the TSI shall audit gantry location(s), by direction, as designated by CTRMA with a statistically significant sample size, as shown below, to show SLA compliance. The TSI shall use the same sample set for the AC1 and AC2 monthly audits.</p> <p>The TSI shall coordinate with CTRMA to ensure that every gantry location receives an audit within a calendar year. The TSI shall coordinate with CTRMA to determine the gantry locations to be audited each month.</p> <p>Accruing more errors than allowed as indicated in the following table shall result in an audit failure of AC1:</p> <table border="1"> <thead> <tr> <th>Sample Set</th> <th>Required Samples</th> <th>Allowed Errors</th> </tr> </thead> <tbody> <tr> <td>Set 1</td> <td>804</td> <td>0</td> </tr> <tr> <td>Set 2</td> <td>1,497</td> <td>1</td> </tr> </tbody> </table>	Sample Set	Required Samples	Allowed Errors	Set 1	804	0	Set 2	1,497	1
		Sample Set	Required Samples	Allowed Errors										
Set 1	804	0												
Set 2	1,497	1												
<p>Measurement method:</p> $\text{Automatic Vehicle Detection Accuracy (Per Gantry Location by Direction) \%} = \left[1 - \left(\frac{\text{Number of missed and duplicate vehicles}}{\text{Total number of vehicles in sample}} \right) \right] \times 100$														

SLA ID	SLA Name	Key Performance Indicator Description	Service Level Agreement	Damages	Measurement Requirement
		<ol style="list-style-type: none"> 1. During OAT, the TSI will deploy DVAS cameras to all locations and will record enough video to support the sample size described above. 2. The TSI will provide video data and system-generated transaction reports each month upon request to CTRMA to determine the accuracy of Vehicle Detection. The required format of video and reports will be defined in the design phase of the project. 3. The TSI shall provide a summary report describing the results of this video audit, with all discrepancies clearly identified and an SLA result. 4. The TSI shall include the results of this report for calculation of the Vehicle Detection SLA and possible damages in their Monthly Maintenance Report. 5. At their discretion, CTRMA may perform, or seek the assistance of a third-party, to perform an audit of this SLA in addition to the TSI's audit. 6. CTRMA shall enforce damages on any failing SLA, whether calculated by the TSI, CTRMA, or a CTRMA-designated third-party. 7. At CTRMA's discretion, CTRMA shall require the TSI to re-audit locations that have failed to meet the SLA measurement for the previous month. 			

SLA ID	SLA Name	Key Performance Indicator Description	Service Level Agreement	Damages	Measurement Requirement									
AC2	Automatic Vehicle Classification	<p>Each vehicle passing through a gantry location with vehicle classification requirements will be correctly classified, including vehicles straddling the lanes. Shoulders are excluded from this calculation.</p> <p>The TSI will reconcile discrepancies from the audits within 30 calendar days.</p>	99.75% with an 80% Confidence Level	For each gantry location by direction, every 0.1% below the SLA, the TSI shall be subject to liquidated damages in the amount of 1% of the monthly maintenance fee.	<p>Each month, the TSI shall audit gantry location(s), by direction, as designated by CTRMA with a statistically significant sample size, as shown below, to show SLA compliance. The TSI shall use the same sample set for the AC1 and AC2 monthly audits.</p> <p>The TSI shall coordinate with CTRMA to ensure that every plaza location receives an audit within a calendar year. The TSI shall coordinate with CTRMA to determine the gantry locations to be audited each month.</p> <p>Accruing more errors than allowed as indicated in the following table shall result in an audit failure of AC2:</p> <table border="1"> <thead> <tr> <th>Sample Set</th> <th>Required Samples</th> <th>Allowed Errors</th> </tr> </thead> <tbody> <tr> <td>Set 1</td> <td>1,711</td> <td>2</td> </tr> <tr> <td>Set 2</td> <td>2,205</td> <td>3</td> </tr> </tbody> </table>	Sample Set	Required Samples	Allowed Errors	Set 1	1,711	2	Set 2	2,205	3
Sample Set	Required Samples	Allowed Errors												
Set 1	1,711	2												
Set 2	2,205	3												
<p>Measurement method:</p> <p><i>Automatic Vehicle Classification Accuracy (Per Gantry Location by Direction)%</i></p> $= \left[1 - \left(\frac{\text{Axle-Based Classification Errors}}{\text{Total number of vehicles in sample}} \right) \right] \times 100$ <ol style="list-style-type: none"> 1. During OAT, the TSI will deploy DVAS cameras to all locations and will record enough video to support the sample size described above. 2. TSI will provide video data and system-generated transaction reports each month upon request to the CTRMA to determine the accuracy of Vehicle Classification. The required format of video and reports will be defined in the design phase of the project. 														

SLA ID	SLA Name	Key Performance Indicator Description	Service Level Agreement	Damages	Measurement Requirement
		<ol style="list-style-type: none"> 3. The TSI shall provide a summary report describing the results of this video audit, with all discrepancies clearly identified and an SLA result. 4. The TSI shall include the results of this report for calculation of the Vehicle Classification SLA and possible damages in their Monthly Maintenance Report. 5. At their discretion, CTRMA may perform, or seek the assistance of a third-party, to perform an audit of this SLA in addition to the TSI's audit. 6. CTRMA shall enforce damages on any failing SLA, whether calculated by the TSI, CTRMA, or a CTRMA-designated third-party. 7. At CTRMA's discretion, CTRMA shall require the TSI to re-audit locations that have failed to meet the SLA measurement for the previous month. 			

SLA ID	SLA Name	Key Performance Indicator Description	Service Level Agreement	Damages	Measurement Requirement									
AC3	Automatic Vehicle Identification	<p>The AVI subsystem will correctly detect, read, and correlate to the correct vehicle 99.80% of all properly installed Transponders on all detected vehicles, including vehicles straddling the lanes.</p> <p>The TSI will reconcile discrepancies from the audits within 30 calendar days.</p>	99.80% with an 80% Confidence Level	For each gantry location by direction, every 0.1% below the SLA, the TSI shall be subject to liquidated damages in the amount of 1% of the monthly maintenance fee.	<p>Each month, the TSI shall audit gantry location(s), by direction, as designated by CTRMA with a statistically significant sample size, as shown below, to show the SLA compliance. The TSI shall use the same sample set for the AC1 and AC2 monthly audits.</p> <p>The TSI shall coordinate with CTRMA to ensure that every plaza location receives an audit within a calendar year. The TSI shall coordinate with CTRMA to determine the plaza locations to be audited each month.</p> <p>Accruing more errors than allowed as indicated in the following table shall result in an audit failure of AC3:</p> <table border="1"> <thead> <tr> <th>Sample Set</th> <th>Required Samples</th> <th>Allowed Errors</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>804</td> <td>0</td> </tr> <tr> <td>2</td> <td>1,497</td> <td>1</td> </tr> </tbody> </table>	Sample Set	Required Samples	Allowed Errors	1	804	0	2	1,497	1
Sample Set	Required Samples	Allowed Errors												
1	804	0												
2	1,497	1												
<p>Measurement method:</p> $ \text{Automatic Vehicle Identification Accuracy (per Gantry Location by Direction)\%} = \left[1 - \left(\frac{(\text{Detection and Read Errors}) + (\text{Correlation Errors})}{(\text{Detection and Read Audited Samples}) + (\text{Correlation Audited Samples})} \right) \right] \times 100 $ <p>For AVI Detect and Read Accuracy:</p> <ol style="list-style-type: none"> The TSI shall develop a report that provides all vehicle transactions per gantry location. From this data set, the transactions shall be filtered for tag reads and non-tag read vehicle transactions. 														

SLA ID	SLA Name	Key Performance Indicator Description	Service Level Agreement	Damages	Measurement Requirement
		<ol style="list-style-type: none"> 2. Another filter query shall remove transactions with an indicated vehicle speed between stop-and-go to 100 mph. 3. From this data set, transactions with the same transponder shall be matched with other vehicle transactions that occurred on the same roadway, on the same day. 4. The accuracy is calculated by the number of vehicles charged as an iToll at a plaza that had a tag read on the same roadway, on the same day. This value is then divided by the total number of vehicles at that plaza on that day. <p>For AVI Correlation Errors:</p> <ol style="list-style-type: none"> 1. The TSI shall develop a report that provides transactions and all images captured for each transaction occurring within a CTRMA selected time. Only AVI transactions will be used. All non-AVI transactions shall be removed. 2. Transactions shall be matched with other vehicle transactions that occurred on the roadway in the same audit period. 3. During a manual image review process, the images of the audited transponder transactions shall be compared to images from another transaction for the same transponder. If the images from both transactions show the same vehicle, this represents a correct AVI correlation. 4. However, if the images from both initial transactions show different vehicles, images from a third transaction for the audited transponder shall be compared. 5. If the images from this third transaction match the audited transaction, the audit shall consider the audited transponder correctly correlated to the transaction. 6. If the images of the third transaction do not match the audited transaction, the audit shall consider the audited transponder to have an AVI correlation error. 7. At their discretion, CTRMA may perform, or seek the assistance of a third-party, to perform an audit of this SLA in addition to the TSI's audit. 8. CTRMA shall enforce damages on any failing SLA, whether calculated by the TSI, CTRMA, or a CTRMA-designated third-party. 9. At CTRMA's discretion, CTRMA shall require the TSI to re-audit locations that have failed to meet the SLA measurement for the previous month. 			

SLA ID	SLA Name	Key Performance Indicator Description	Service Level Agreement	Damages	Measurement Requirement
AC4	VES Image Capture and Correlation Accuracy	The VES will correctly capture and associate one front human-readable license plate image or one rear human-readable license plate image and associated with the correct vehicle for 99.80% of all detected vehicles, including vehicles straddling the lane and shoulder.	99.80%	For each gantry location by direction, every 0.5% below the SLA, the TSI shall be subject to liquidated damages in the amount of 1% of the monthly maintenance fee.	Each month, as reported in TSI provided reports.
		Measurement method: $VES \text{ Image Capture and Correlation Accuracy (for each Gantry Location by Direction)\%} = \left[1 - \left(\frac{\text{Detected Vehicles Without a Readable Front and Rear License Plate Image}}{\text{All Detected Vehicles} - \text{Exclusions}} \right) \right] \times 100$ <ol style="list-style-type: none"> 1. A monthly, system-wide report, that calculates image readability performance from code-off within the image reviewed transactions. 2. This metric only evaluates legally mounted license plates. 3. Excludes: <ol style="list-style-type: none"> a. Vehicles traveling in the wrong direction. b. Vehicles in tow using rope, chains, or other unorthodox methods. c. Vehicles with missing, damaged, or obstructed license plates. 			
AC5	False "Coded-off" Images	For transactions rejected by the automated and/ or manual review process, less than 1.00% shall have incorrect code-off results. "Coded-Off" means the TSI stated they could not determine the license plate data.	<1.50%	Every 0.1% above the SLA, the TSI shall be subject to liquidated damages in the amount of 1% of the monthly maintenance fee.	Each month, as determined by TSI audited sample of code-offs. TSI shall coordinate with CTRMA monthly to determine a statistically significant sample size, as shown below, to show the SLA compliance. The TSI shall coordinate with CTRMA to determine the plaza

SLA ID	SLA Name	Key Performance Indicator Description	Service Level Agreement	Damages	Measurement Requirement									
					<p>location(s) to be audited each month.</p> <p>Accruing more errors than allowed as indicated in the following table shall result in an audit failure of AC5:</p> <table border="1"> <thead> <tr> <th>Sample Set</th> <th>Required Samples</th> <th>Allowed Errors</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>107</td> <td>0</td> </tr> <tr> <td>2</td> <td>199</td> <td>1</td> </tr> </tbody> </table>	Sample Set	Required Samples	Allowed Errors	1	107	0	2	199	1
Sample Set	Required Samples	Allowed Errors												
1	107	0												
2	199	1												
		<p>Measurement method:</p> $\text{Measured Accuracy \%} = \left(\frac{\text{Images Incorrectly Coded Off}}{\text{All Manually Reviewed Images}} \right) \times 100$												
AC6	License Plate Read Accuracy	<p>Percentage of Human Readable Plate Images that are correctly determined either with ALPR or automated and/ or manual review.</p> <p>“Correctly determined” means that the plate number, jurisdiction, and any plate type are accurate.</p> <p>The TSI shall correctly determine the License plate number, jurisdiction, and type information for all transactions processed requiring license plate number identification for billing purposes.</p>	98.50% with an 80% Confidence Level	For every 0.1% below the SLA, the TSI shall be subject to liquidated damages in the amount of 1% of the monthly maintenance fee.	<p>Each month, as determined by TSI audited sample of image-based transactions.</p> <p>TSI shall coordinate with CTRMA monthly to determine a statistically significant sample size, as shown below, to show the SLA compliance.</p> <p>The TSI shall coordinate with CTRMA to determine the plaza location(s) to be audited each month.</p>									

SLA ID	SLA Name	Key Performance Indicator Description	Service Level Agreement	Damages	Measurement Requirement									
					<p>Accruing more errors than allowed as indicated in the following table shall result in an audit failure of AC6:</p> <table border="1"> <thead> <tr> <th>Sample Set</th> <th>Required Samples</th> <th>Allowed Errors</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>107</td> <td>0</td> </tr> <tr> <td>2</td> <td>199</td> <td>1</td> </tr> </tbody> </table>	Sample Set	Required Samples	Allowed Errors	1	107	0	2	199	1
Sample Set	Required Samples	Allowed Errors												
1	107	0												
2	199	1												
		<p>Measurement method:</p> $\text{License Plate Read Accuracy \%} = \left(\frac{\text{Number of Correctly Determined Vehicle License plates}}{\text{Total number of vehicle license plates}} \right) \times 100$												
AC7	Express Lane Trip Building	99.50% of all transactions shall be correctly assembled into trips per CTRMA business rules on all express lane roadways, which use trip building for tolling.	99.50%	For every 0.1% below the SLA, the TSI shall be subject to liquidated damages in the amount of 1% of the monthly maintenance fee.	Each month, as determined by TSI provided reports.									
		<p>Measurement method:</p> $\text{Express Lane Trip Accuracy \%} = \left[1 - \left(\frac{\text{Express Lane Transactions Not Assembled into a Trip}}{\text{Express Lane Transactions Assembled into a Trip}} \right) \right] \times 100$												
SLA ID	SLA Name	Key Performance Indicator Description	Service Level Agreement	Damages	Measurement Requirement									

SLA ID	SLA Name	Key Performance Indicator Description	Service Level Agreement	Damages	Measurement Requirement
AC8	Non-Express Lane Trip Aggregation* *Note – AC8 only applies if the TSI implements trip aggregation	99.50% of all transactions shall be correctly assembled into trips per the CTRMA business rules on all non-express lane roadways, which use trip aggregation for tolling.	99.50%	For every 0.1% below the SLA, the TSI shall be subject to liquidated damages in the amount of 1% of the monthly maintenance fee.	Each month, as determined by TSI provided reports.
		Measurement method: $\text{Non – Express Lane Trip Aggregation Accuracy \%} = \left[1 - \left(\frac{\text{Non Express Lane Transactions Not Assembled into a Trip}}{\text{Non Express Lane Transactions Assembled into a Trip}} \right) \right] \times 100$			
AC9	VTMS Accuracy	Each VTMS will post and maintain the correct toll rate per the CTRMA business rules to the VTMS 99.95% of the time.	99.95%	Average of historical fare amount during the outage periods, regardless of CTRMA’s ability to collect the fares.	Each month, as determined by TSI provided reports.
		Measurement method: $\text{VTMS Accuracy \%} = \left[1 - \left(\frac{\text{Time VTMS Shows Incorrect Toll Rate}}{\text{Expected Hours of Operations}} \right) \right] \times 100$			

SLA ID	SLA Name	Key Performance Indicator Description		Service Level Agreement	Damages	Measurement Requirement									
AC10	MVDS Volume Accuracy	The volume provided by Traffic Detection Systems (MVDS) shall be 90.00% accurate.	90.00% with an 80% Confidence Level		For every 0.1% below the SLA, the TSI shall be subject to liquidated damages in the amount of 1% of the monthly maintenance fee.	<p>Each month, as determined by TSI audited sample of MVDS vehicle volume.</p> <p>TSI shall coordinate with CTRMA monthly to determine a statistically significant sample size, as shown below, to show the SLA compliance.</p> <p>The TSI shall coordinate with CTRMA to determine the MVDS(s) to be audited each month.</p> <p>Accruing more errors than allowed as indicated in the following table shall result in an audit failure of AC10:</p> <table border="1"> <thead> <tr> <th>Sample Set</th> <th>Required Samples</th> <th>Allowed Errors</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>16</td> <td>0</td> </tr> <tr> <td>2</td> <td>29</td> <td>1</td> </tr> </tbody> </table>	Sample Set	Required Samples	Allowed Errors	1	16	0	2	29	1
		Sample Set	Required Samples	Allowed Errors											
1	16	0													
2	29	1													
Measurement method:		$MVDS \text{ Volume Accuracy } \% = \left[1 - \left(\frac{\frac{DVAS}{CCTV} \text{ Volume} - MVDS \text{ Volume}}{\frac{DVAS}{CCTV} \text{ Volume}} \right) \right] \times 100$ <p>The MVDS Volume is the volume provided by the MVDS being measured, and the DVAS/CCTV Volume is the volume calculated by monitoring the DVAS/CCTV camera(s) near the MVDS being measured.</p>													

SLA ID	SLA Name	Key Performance Indicator Description	Service Level Agreement	Damages	Measurement Requirement
Performance					
SP1	Aggregated/Trip Transaction Processing time	99.90% of all transactions must be fully processed within four (4) calendar days of the transaction creation date (lane date) and successfully transmitted to the CTRMA Data Platform System per approved the CTRMA business rules within agreed constraints of any external the CTRMA systems or interfaces.	99.90% within four (4) calendar days	Actual transaction fare amount from the delayed transactions, regardless of CTRMA’s ability to collect the fares.	Each month, as determined by TSI provided reports.
		Measurement method: $\text{Transaction Processing Time Performance \%} = \left(\frac{\text{Number of Processed Aggregated/Trip Transactions within required time}}{\text{Number of Processed Aggregated/Trip Transactions}} \right) \times 100$			
SP2	Non-Aggregated/Trip Transaction Processing time	99.90% of all transactions must be fully processed within two (2) calendar days of the transaction creation date (lane date) and successfully transmitted to the CTRMA Data Platform System per approved the CTRMA business rules within agreed constraints of any external the CTRMA systems or interfaces.	99.90% within two (2) calendar days	Actual transaction fare amount from the delayed transactions, regardless of CTRMA’s ability to collect the fares.	Each month, as determined by TSI provided reports.
		Measurement method: $\text{Transaction Processing Time Performance \%} = \left(\frac{\text{Number of Processed Non – Aggregated/Trip Transactions within required time}}{\text{Number of Processed Non – Aggregated/Trip Transactions}} \right) \times 100$			

SLA ID	SLA Name	Key Performance Indicator Description	Service Level Agreement	Damages	Measurement Requirement
SP3	Image Processing time (manual or automated)	For transactions requiring a manual or automated review process, 99.0% shall be completed within 72 hours from the time the transaction qualified for manual review.	99.0% within 72 hours	For every 0.1% below the SLA, the TSI shall be subject to liquidated damages in the amount of 1% of the monthly maintenance fee.	Each month, as determined by TSI provided reports.
		Measurement method: $\text{Image Processing Time Performance \%} = \left(\frac{\text{Number of Transaction Reviews Completed within required time}}{\text{Number of Transactions Sent to Review}} \right) \times 100$			
SP4	Monthly Maintenance Report processing time	The monthly report, accurately detailing system performance relative to all Project SLAs, shall be submitted to CTRMA within ten (10) business days of each month-end, commencing the first full month (Month 1) following go-live (start of revenue collection).	Within ten (10) business days of each month-end.	For every 1 calendar day outside the SLA, 1% of the monthly maintenance fee.	Determined by date Monthly Maintenance report received (email timestamp).
		Measurement method: $\text{Report Submission Date} = (\text{Date}_{\text{Report Delivered}}) - (\text{Date}_{\text{Report Due}})$			

SLA ID	SLA Name	Key Performance Indicator Description	Service Level Agreement	Damages	Measurement Requirement
SP5	Report Generation (> 1,000,000 records)	<p>Report Generation pertains to the display of non-ad-hoc reports generated on all systems delivered under the scope of the Project, measured from the time the user completes the report request in the UI to the time the report is displayed on the screen or generated as a .csv file. For the measurement of this SLA, no more than three queries that will result in 1,000,000+ records returned will be conducted simultaneously.</p>	<p>Within 5 minutes for Every 1,000,000 records included in the report.</p>	<p>For each sample set's times taken as an average, for every 5 minutes outside the SLA, the TSI shall be subject to liquidated damages in the amount of 1% of the monthly maintenance fee.</p>	<p>Each month, as determined by TSI provided reports</p>
		<p>Measurement method:</p> $> 1M \text{ Report Generation time} = (Report_{Report \text{ start time}}) - (Report_{Report \text{ end time}})$			
SP6	Report Generation (< 1,000,000 records)	<p>Report Generation pertains to the display of non-ad hoc reports generated on the Facility Host and all other systems developed under the scope of the Project, measured from the time the user completes the report request in the UI to the time the report is displayed on the screen or generated as a .csv file.</p>	<p>99.90% within 60 seconds and 95.00% within 20 seconds.</p>	<p>For each sample set's times taken as an average, for every 1 minute outside the SLA, the TSI shall be subject to liquidated damages in the amount of 1% of the monthly maintenance fee.</p>	<p>Each month, as determined by TSI provided reports.</p>
		<p>Measurement method:</p> $< 1M \text{ Report Generation time} = (Report_{Report \text{ start time}}) - (Report_{Report \text{ end time}})$			

SLA ID	SLA Name	Key Performance Indicator Description	Service Level Agreement	Damages	Measurement Requirement
SP7	Submission of Monthly Inventory Report	<p>The monthly Inventory report, accurately detailing the location, count, and serial numbers of all the CTRMA hardware, including retired hardware (if applicable), spares and Return Material Authorization (RMA) hardware for the previous calendar month, shall be submitted to CTRMA within ten (10) business days of each month-end, commencing the first full month (Month 1) following go-live (start of revenue collection).</p> <p>Measurement method:</p> $Report\ Submission\ Date = (Date_{Report\ Delivered}) - (Date_{Report\ Due})$	Within ten (10) business days of each month-end.	For the monthly inventory report every 1 calendar day outside the SLA, 1% of the monthly maintenance fee.	Determined by date Monthly Inventory report received (email timestamp).
SP8	Submission of Yearly Inventory Report	<p>The TSI shall perform a full physical inventory audit annually to verify consistency between the MOMS inventory management system and the actual count.</p> <p>The Yearly Inventory report shall accurately detail the location, count, and serial numbers of all the CTRMA hardware, including retired hardware (if applicable), spares, and outstanding Return Material Authorization (RMA) hardware for the previous calendar year.</p> <p>The Yearly Inventory Report shall be submitted to CTRMA each year, commencing the first full month (Month</p>	<p>Months 1 – 11: Initial report submitted on month 12 within ten (10) business days from the beginning of the 12th month.</p> <p>Months 12 and beyond: Report submitted on month 12 within ten (10) business days from the beginning of the 12th month.</p>	For the yearly report, every 1 calendar day outside the SLA, 1% of the monthly maintenance fee.	Determined by date Annual Inventory report received (email timestamp).

SLA ID	SLA Name	Key Performance Indicator Description	Service Level Agreement	Damages	Measurement Requirement
		1) following go-live (start of revenue collection).			
		Measurement method: $Report\ Submission\ Date = (Date_{Report\ Delivered}) - (Date_{Report\ Due})$			
SP9	Submission of Annual SOC Audit Report	<p>TSI must provide a "SOC 1 Type 2" Report or a SOC 1 readiness assessment 180 days after first system acceptance, and a SOC 1 Type 2 Report for all subsequent submittals.</p> <p>The TSI must address any exceptions identified in the SOC I Type 2 report within 30 calendar days from the date the SOC I Type 2 is delivered to the CTRMA.</p>	<p>If the TSI is unable to address all exceptions within 30 calendar days, the TSI must submit a written management plan to the CTRMA detailing the planned actions to address all remaining exceptions within 90 calendar days from the initial SOC report submission date.</p> <p>If the TSI is unable to address all exceptions within 90 calendar days, the TSI must submit a revised written management plan to the CTRMA detailing the planned actions and schedule to address all remaining exceptions within 120 calendar days from the initial SOC report submission date.</p>	<p>5% of the monthly maintenance fee each month beginning after 1 month from the date the SOC report was delivered to CTRMA until all exceptions have been addressed to CTRMA's satisfaction.</p> <p>25% of the monthly maintenance fee each month beginning after 3 months from the date the SOC report was delivered to CTRMA until all exceptions have been addressed to CTRMA's satisfaction.</p>	Determined by date SOC report is due per the Agreement

SLA ID	SLA Name	Key Performance Indicator Description	Service Level Agreement	Damages	Measurement Requirement
			If the TSI is unable to address all exceptions within 120 calendar days, the TSI must submit a revised written management plan to the CTRMA detailing the planned actions and schedule to address all remaining exceptions within 180 calendar days from the initial SOC report submission date.	100% of the monthly maintenance fee each month beginning after 4 months from the date the SOC report was delivered to CTRMA until all exceptions have been addressed to CTRMA's satisfaction.	

SLA ID	SLA Name	Key Performance Indicator Description	Service Level Agreement	Damages	Measurement Requirement
Availability					
AV1	Lane Availability	Each lane shall be available 99.5% of the time. An available lane is defined as a lane with the ability to collect revenue through both image capture and tag read/association. Measurement method: $\text{Measured Availability \%} = \left[1 - \left(\frac{\text{Lane Downtime}}{\text{Lane Uptime} + (\text{Lane Downtime} - \text{Exception Time})} \right) \right] \times 100$	99.5%	For each lane, every 0.1% below the SLA, the TSI shall be subject to liquidated damages in the amount of \$200.	Each month, as determined by TSI provided reports.
AV2	Host Availability	The Host Level applications and the system shall be available 99.50% of the time, excluding scheduled maintenance.	99.50%	For every 0.1% or portion thereof below the SLA, the	Each month, as determined by TSI provided reports.

		An available host is defined as a fully operating host, including hardware and software such that all applications, reports, MOMS, and transaction processing are online and available for users.		TSI shall be subject to liquidated damages in the amount of 1% of the monthly maintenance fee.	
		Measurement method:			
		$\text{Measured Availability \%} = \left[1 - \left(\frac{\text{Host Downtime}}{\text{Total Host Expected Operational Time}} \right) \right] \times 100$			
		Each Express Lanes CCTV shall be available 98.0% of the time, excluding scheduled maintenance.	98.0%	\$200 per each 0.1% below threshold.	Each month, as determined by TSI provided reports.
AV3	Express Lane CCTV Availability	Measurement method:			
		$\begin{aligned} &\text{Measured Availability \%} \\ &= \left[1 - \left(\frac{(\text{Total Hours Express Lane CCTV System Downtime}) - \text{Exclusions}}{(\text{Expected Hours of Operations}) - \text{Exclusions}} \right) \right] \times 100 \end{aligned}$			
		Each non-Express Lane CCTV shall be available 95% of the time, excluding scheduled maintenance.	95%	\$200 per each 0.1% below threshold.	Each month, as determined by TSI provided reports.
AV4	Non-Express Lane CCTV Availability	Measurement method:			
		$\begin{aligned} &\text{Measured Availability \%} \\ &= \left[1 - \left(\frac{(\text{Total Hours Non - Express Lane CCTV System Downtime}) - \text{Exclusions}}{(\text{Expected Hours of Operations}) - \text{Exclusions}} \right) \right] \times 100 \end{aligned}$			

SLA ID	SLA Name	Key Performance Indicator Description	Service Level Agreement	Damages	Measurement Requirement
AV5	Express lane MVD availability	Each Express Lane Segment shall be available 99.90% of the time. An available segment is defined as a segment where at least 75% of MVD sensors are available at any given time.	99.90% per segment	For every 0.1% or portion thereof below the SLA per segment, the TSI shall be subject to liquidated damages in the amount of 1% of the monthly maintenance fee.	Each month, as determined by TSI provided reports.
		Measurement method: $\text{Measured Availability \%} = \left[1 - \left(\frac{(\text{Total Hours Express Lane MVD System Downtime}) - \text{Exclusions}}{(\text{Expected Hours of Operations}) - \text{Exclusions}} \right) \right] \times 100$			
AV6	VTMS Availability	Each VTMS shall be available 99.80%, excluding scheduled maintenance.	99.80%	Average of historical fare amount during the outage periods, regardless of CTRMA's ability to collect the fares.	Each month, as determined by TSI provided reports.
		Measurement method: $\text{Measured Availability \%} = \left[1 - \left(\frac{(\text{Total Hours VTMS System Downtime}) - \text{Exclusions}}{(\text{Expected Hours of Operations}) - \text{Exclusions}} \right) \right] \times 100$			

SLA ID	SLA Name	Key Performance Indicator Description	Service Level Agreement	Damages	Measurement Requirement
Maintenance (Response/Repair timing)					
<p>Response Time: Response Time is always measured as beginning when the system generates an alert/ticket, the TSI is notified a priority event has occurred and/or a failure event has occurred, whichever occurs first, and ending when the TSI acknowledges the alert, ticket and/or event via an approved communication method (e.g. MOMS).</p>					
<p>Repair Time: Repair time is always measured as beginning when the time the TSI acknowledges the ticket for the event or failure and ending when the failure condition is corrected, and the system is returned to normal operation.</p>					
<p>Priority 1: Failure that will result in: loss of ability to accurately collect revenue; inability to accurately and timely process transactions or trips per the CTRMA business rules; lane closure; safety hazard; or loss of auditability.</p>					
RR1	Time to Respond – Priority 1	<p>All priority 1 events must have a ticket created and be acknowledged within 15 minutes of notification of a priority 1 event.</p>	15 minutes	\$300 for every 30 minutes beyond the SLA per event.	Each month, as determined by TSI provided reports.
		<p>Measurement method:</p> $P1 \text{ Response Time} = \text{minimum of } (T_{Arrival} - T_{Notice}) \text{ or } (T_{Acknowledge} - T_{Notice})$			

SLA ID	SLA Name	Key Performance Indicator Description	Service Level Agreement	Damages	Measurement Requirement
RR2	Time to Repair – Priority 1	All priority 1 tickets must be repaired within 3 hours of ticket acknowledgement.	3 hours	\$500 for every 30 minutes beyond the SLA per event.	Each month, as determined by TSI provided reports.
		Measurement method: $P1 \text{ Repair Time} = (T_{Corrected} - T_{Notice})$			
Priority 2: Failure of a system component that will result in a degradation of system performance or results in the loss of redundancy in a key system component but does not qualify as a Priority 1 event.					
RR3	Time to Respond – Priority 2	All priority 2 events must have a ticket created and be acknowledged within 30 minutes of notification of a priority 2 event.	30 minutes	\$150 for every 30 minutes beyond the SLA per event.	Each month, as determined by TSI provided reports.
		Measurement method: $P2 \text{ Response Time} = \text{minimum of } (T_{Arrival} - T_{Notice}) \text{ or } (T_{Acknowledge} - T_{Notice})$			
RR4	Time to Repair – Priority 2	All priority 2 tickets must be repaired within 6 hours of ticket acknowledgement.	6 hours	\$250 for every 30 minutes beyond the SLA per event.	Each month, as determined by TSI provided reports.
		Measurement method: $P2 \text{ Repair Time} = (T_{Corrected} - T_{Notice})$			

SLA ID	SLA Name	Key Performance Indicator Description	Service Level Agreement	Damages	Measurement Requirement
Priority 3: Any action or event reported that will/may impact operational performance, has potential of degrading the System performance, and has no impact to revenue collection.					
RR5	Time to Respond – Priority 3	<p>All priority 3 events must have a ticket created and be acknowledged within 30 minutes of notification of a priority 3 event.</p> <p>Measurement method:</p> $P3 \text{ Response Time} = \text{minimum of } (T_{\text{Arrival}} - T_{\text{Notice}}) \text{ or } (T_{\text{Acknowledge}} - T_{\text{Notice}})$	30 minutes	\$75 for every 30 minutes beyond the SLA per event.	Each month, as determined by TSI provided reports.
RR6	Time to Repair – Priority 3	<p>All priority 3 tickets must be repaired within 24 hours of ticket acknowledgement.</p> <p>Measurement method:</p> $P3 \text{ Repair Time} = (T_{\text{Corrected}} - T_{\text{Notice}})$	24 hours	\$125 for every 30 minutes beyond the SLA per event.	Each month, as determined by TSI provided reports.

APPENDIX G
Key Personnel

KEY PERSONNEL

Darby Swank	Principal-in-Charge
Mike Yager	Program Manager
Danielle Bordeaux	Deputy Program Manager
Kenneth Engelke	Installation Manager and Interim Onsite Maintenance Manager
Donnie Collins	Maintenance Manager
Quality Manager	Ken Acosta

APPENDIX H
Contractor's Proposal

APPENDIX I-1
Form of Installation Performance Bond

FORM OF INSTALLATION PERFORMANCE BOND

**AGREEMENT FOR ROADSIDE TOLL COLLECTION SYSTEM INSTALLATION
AND MAINTENANCE SERVICES**

Bond No. _____

KNOW ALL PERSONS BY THESE PRESENTS, that Electronic Transaction Consultants, LLC, a Delaware limited liability company, as “Principal” and _____, as “Surety” or as “Co-Sureties”, each a corporation duly organized under the laws of the State indicated on the attached page, having its principal place of business at the address listed on the attached page, in the State indicated on the attached page, and authorized as a surety in the State of Texas, are hereby jointly and severally held and firmly bound unto the CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY (the “Authority”), a political subdivision of the State of Texas, as “Obligee”, in the sum of [\$_____] (the “Bonded Sum”), for the payment whereof Principal and Surety (or Co-Sureties), bind themselves, and their heirs, executors, administrators, representatives, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Obligee, has awarded to Principal, the Amended and Restated Agreement for Roadside Toll Collection System Installation and Maintenance Services, duly executed and delivered as of [_____], 202[] (the “Agreement”), on the terms and conditions set forth therein; and

WHEREAS, upon the issuance of Work Authorization Number __, dated _____ pursuant to Article 2, subsection 2.1., Principal is required to furnish a bond guaranteeing the faithful performance of its obligations under the Agreement;.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH THAT, if Principal shall promptly and faithfully perform all of its obligations under the Agreement, including any and all amendments and supplements thereto, then this obligation shall be null and void; otherwise it shall remain in full force and effect. The Obligee shall release this bond upon the conclusion of the term of the Agreement as set forth in Article (7)(d)(ii) of the Agreement.

The following terms and conditions shall apply with respect to this bond:

1. The Agreement is incorporated by reference herein.
2. This bond specifically guarantees (1) the performance of each and every obligation of Principal under the Agreement, as it may be amended and supplemented, including but not limited to, its liability for liquidated damages as specified in the Agreement, but not to exceed the penal amount described in Article (7)(d)(ii).
3. Whenever Principal shall be, and is declared by the Obligee to be, in default under the Agreement and the Obligee has formally terminated the Principal’s right to complete the Services required under the Agreement, provided that the Obligee is not then in material default thereunder, Surety shall promptly take one of the following actions with the consent of the Obligee:

- a. arrange for the Principal to perform and complete the Agreement;
- b. complete the Services required under the Work Authorization then in effect in accordance with the terms and conditions of the Agreement then in effect, through its agents or through independent contractors;
- c. obtain bids or negotiated proposals from qualified contractors acceptable to the Obligee for a contract for performance and completion of the Services required under the Work Authorization, arrange for a contract to be prepared for execution by the Obligee and the contractor selected with the Obligee's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Agreement in an amount that corresponds to the amount of the Work Authorization to be completed, and pay to the Obligee the amount of damages as described in Article 7 of the Agreement; or
- d. waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances, (i) after investigation, determine the amount for which it may be liable to the Obligee and, as soon as practicable after the amount is determined, tender payment therefore to the Obligee, or (ii) deny liability in whole or in part and notify the Obligee citing reasons therefore.

5. If Surety does not proceed as provided in Paragraph 3 with reasonable promptness, Surety shall be deemed to be in default on this Bond fifteen (15) days after receipt of an additional written notice from the Obligee to Surety demanding that Surety perform its obligations under this Bond, and the Obligee shall be entitled to enforce any remedy available to the Obligee. If Surety proceeds as provided in Subparagraph 3.d, and the Obligee refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice the Obligee shall be entitled to enforce any remedy available to the Obligee.

6. After the Obligee has terminated the Principal's right to complete the Agreement, and if Surety elects to act under Subparagraph 3.a, 3.b, or 3.c above, then the responsibilities of Surety to the Obligee shall not be greater than those of the Principal under the Agreement, and the responsibilities of the Obligee to Surety shall not be greater than those of the Obligee under the Agreement. To the limit of the Bonded Sum, Surety is obligated without duplication for:

- a. the responsibilities of the Principal for correction of defective work and completion of the Services required under the Agreement;
- b. additional legal and delay costs resulting from Principal's default, and resulting from the actions or failure to act of Surety under Paragraph 3; and
- c. liquidated damages under the Agreement.

7. No alteration, modification or supplement to the Agreement or the nature of the work to be performed thereunder, including without limitation any extension of time for performance, shall in any way affect the obligations of Surety under this bond.

8. Correspondence or claims relating to this bond should be sent to Surety at the following address:

9. No right of action shall accrue on this bond to or for the use of any entity other than the Obligee or its successors and assigns.

10. If any legal action be filed on this bond, venue shall be in Travis County, Texas.

11. This bond is executed in accordance with the provisions of Chapter 2253 of the Texas Government Code, as amended.

12. Initially capitalized terms not otherwise defined herein shall have the definition set forth in the Agreement.

IN WITNESS WHEREOF, Principal and Surety have caused this bond to be executed and delivered as of [_____], 202[_____].

Principal:

By: _____

Its: _____

(Seal)

Surety:

By: _____

Its: _____

(Seal)

[ADD APPROPRIATE SURETY ACKNOWLEDGMENTS]

APPENDIX I-2
Form of Installation Payment Bond

FORM OF INSTALLATION PAYMENT BOND

**AGREEMENT FOR ROADSIDE TOLL COLLECTION SYSTEM INSTALLATION
AND MAINTENANCE SERVICES**

Bond No. _____

KNOW ALL PERSONS BY THESE PRESENTS, that Electronic Transaction Consultants, LLC, a Delaware limited liability company, as “Principal” and _____, as “Surety” or as “Co-Sureties”, each a corporation duly organized under the laws of the State indicated on the attached page, having its principal place of business at the address listed on the attached page, in the State indicated on the attached page, and authorized as a surety in the State of Texas, are hereby jointly and severally held and firmly bound unto the CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY (the “Authority”), a political subdivision of the State of Texas, as “Obligee”, in the sum of [\$_____] (the “Bonded Sum”), for the payment whereof Principal and Surety (or Co-Sureties), bind themselves, and their heirs, executors, administrators, representatives, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Obligee, has awarded to Principal, the Amended and Restated Agreement for Roadside Toll Collection System Installation and Maintenance Services, duly executed and delivered as of [_____], 202[] (the “Agreement”), on the terms and conditions set forth therein; and

WHEREAS, upon the issuance of Work Authorization Number __, dated _____ pursuant to Article 2, subsection 2.1., Principal is required to furnish a bond guaranteeing payment of claims, subcontractors, suppliers, materialmen and mechanics.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH THAT, if Principal shall fail to pay any valid and timely claims of subcontractors, suppliers, materialmen and mechanics with respect to the Services, then Surety shall pay for the same in an amount not to exceed, in the aggregate, the Bonded Sum; otherwise this obligation shall be null and void upon the conclusion of the term of the Agreement as set forth in Article (7)(d)(ii) of the Agreement.

The following terms and conditions shall apply with respect to this bond:

1. The Agreement is incorporated by reference herein.
2. No alteration, modification or supplement to the Agreement or the nature of the work to be performed thereunder, including without limitation any extension of time for performance, shall in any way affect the obligations of Surety under this bond.
3. Correspondence or claims relating to this bond should be sent to Surety at the following address:

4. This bond shall inure to the benefit of the persons identified above so as to give a right of action to such persons and their assigns in any suit brought upon this bond.

5. To the extent permitted by law, the only permitted claimants under this Bond shall be those entities having a contract with Principal and those entities having a contract with an entity which has a contract with Principal.

6. If any legal action be filed on this bond, venue shall be in Travis County, Texas.

7. This bond is executed in accordance with the provisions of Chapter 2253 of the Texas Government Code, as amended.

8. Initially capitalized terms not otherwise defined herein shall have the definition set forth in the Agreement.

IN WITNESS WHEREOF, Principal and Surety have caused this bond to be executed and delivered as of [_____], 202[_____].

Principal:

By: _____

Its: _____

(Seal)

Surety:

By: _____

Its: _____

(Seal)

[ADD APPROPRIATE SURETY ACKNOWLEDGMENTS]

APPENDIX J-1
Form of Maintenance Performance Bond

FORM OF MAINTENANCE PERFORMANCE BOND

**AGREEMENT FOR ROADSIDE TOLL COLLECTION SYSTEM INSTALLATION
AND MAINTENANCE SERVICES**

Bond No. _____

KNOW ALL PERSONS BY THESE PRESENTS, that Electronic Transaction Consultants, LLC, a Delaware limited liability company, as “Principal” and _____, as “Surety” or as “Co-Sureties”, each a corporation duly organized under the laws of the State indicated on the attached page, having its principal place of business at the address listed on the attached page, in the State indicated on the attached page, and authorized as a surety in the State of Texas, are hereby jointly and severally held and firmly bound unto the CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY (the “Authority”), a political subdivision of the State of Texas, as “Obligee”, in the sum of [\$_____] (the “Bonded Sum”), for the payment whereof Principal and Surety (or Co-Sureties), bind themselves, and their heirs, executors, administrators, representatives, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Obligee, has awarded to Principal, the Amended and Restated Agreement for Roadside Toll Collection System Installation and Maintenance Services, duly executed and delivered as of [_____], 202[] (the “Agreement”), on the terms and conditions set forth therein; and

WHEREAS, as a condition to any final acceptance for Work Authorization Number __, dated _____ pursuant to Article 2, subsection 2.1, and prior to the issuance of the Work Authorization under Article 2, subsection 2.2., Principal is required to furnish a bond guaranteeing the faithful performance of its obligations under the Agreement;

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH THAT, if Principal shall promptly and faithfully perform all of its obligations under the Agreement, including any and all amendments and supplements thereto, then this obligation shall be null and void; otherwise it shall remain in full force and effect. The Obligee shall release this bond upon the conclusion of the term of the Agreement as set forth in Article (7)(d)(iii) of the Agreement.

The following terms and conditions shall apply with respect to this bond:

1. The Agreement is incorporated by reference herein.
2. This bond specifically guarantees (1) the performance of each and every obligation of Principal under the Agreement, as it may be amended and supplemented, including but not limited to, its liability for liquidated damages as specified in the Agreement and loss of revenue incurred by the CTRMA under Article 7(b), but not to exceed the penal amount described in Article (7)(d)(iii).
3. Whenever Principal shall be, and is declared by the Obligee to be, in default under the Agreement and the Obligee has formally terminated the Principal’s right to complete the Services required under the Agreement, provided that the Obligee is not then in material

default thereunder, Surety shall promptly take one of the following actions with the consent of the Obligee:

- a. arrange for the Principal to perform and complete the Agreement;
- b. complete the Services required under any Work Authorization(s) then in effect in accordance with the terms and conditions of the Agreement then in effect, through its agents or through independent contractors;
- c. obtain bids or negotiated proposals from qualified contractors acceptable to the Obligee for a contract for performance and completion of the Services required under any Work Authorization(s) then in effect, arrange for a contract to be prepared for execution by the Obligee and the contractor selected with the Obligee's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Agreement in an amount that corresponds to the amount of Work Authorization(s) to be completed, and pay to the Obligee the amount of damages as described in Article 7 of the Agreement; or
- d. waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances, (i) after investigation, determine the amount for which it may be liable to the Obligee and, as soon as practicable after the amount is determined, tender payment therefore to the Obligee, or (ii) deny liability in whole or in part and notify the Obligee citing reasons therefore.

5. If Surety does not proceed as provided in Paragraph 3 with reasonable promptness, Surety shall be deemed to be in default on this Bond fifteen (15) days after receipt of an additional written notice from the Obligee to Surety demanding that Surety perform its obligations under this Bond, and the Obligee shall be entitled to enforce any remedy available to the Obligee. If Surety proceeds as provided in Subparagraph 3.d, and the Obligee refuses the payment tendered or Surety has denied liability, in whole or in part, without further notice the Obligee shall be entitled to enforce any remedy available to the Obligee.

6. After the Obligee has terminated the Principal's right to complete the Agreement, and if Surety elects to act under Subparagraph 3.a, 3.b, or 3.c above, then the responsibilities of Surety to the Obligee shall not be greater than those of the Principal under the Agreement, and the responsibilities of the Obligee to Surety shall not be greater than those of the Obligee under the Agreement. To the limit of the Bonded Sum, Surety is obligated without duplication for:

- a. the responsibilities of the Principal for correction of defective work and completion of the Services required under the Agreement;
- b. additional legal and delay costs resulting from Principal's default, and resulting from the actions or failure to act of Surety under Paragraph 3; and

c. liquidated damages under the Agreement.

7. No alteration, modification or supplement to the Agreement or the nature of the work to be performed thereunder, including without limitation any extension of time for performance, shall in any way affect the obligations of Surety under this bond.

8. Correspondence or claims relating to this bond should be sent to Surety at the following address:

9. No right of action shall accrue on this bond to or for the use of any entity other than the Obligee or its successors and assigns.

10. If any legal action be filed on this bond, venue shall be in Travis County, Texas.

11. This bond is executed in accordance with the provisions of Chapter 2253 of the Texas Government Code, as amended.

12. Initially capitalized terms not otherwise defined herein shall have the definition set forth in the Agreement.

IN WITNESS WHEREOF, Principal and Surety have caused this bond to be executed and delivered as of [_____], 202[_].

Principal: _____

By: _____

Its: _____

(Seal)

Surety: _____

By: _____

Its: _____

(Seal)

[ADD APPROPRIATE SURETY ACKNOWLEDGMENTS]

APPENDIX J-2
Form of Maintenance Payment Bond

FORM OF MAINTENANCE PAYMENT BOND

**AGREEMENT FOR ROADSIDE TOLL COLLECTION SYSTEM INSTALLATION
AND MAINTENANCE SERVICES**

Bond No. _____

KNOW ALL PERSONS BY THESE PRESENTS, that Electronic Transaction Consultants, LLC, a Delaware limited liability company, as “Principal” and _____, as “Surety” or as “Co-Sureties”, each a corporation duly organized under the laws of the State indicated on the attached page, having its principal place of business at the address listed on the attached page, in the State indicated on the attached page, and authorized as a surety in the State of Texas, are hereby jointly and severally held and firmly bound unto the CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY (the “Authority”), a political subdivision of the State of Texas, as “Obligee”, in the sum of [\$_____] (the “Bonded Sum”), for the payment whereof Principal and Surety (or Co-Sureties), bind themselves, and their heirs, executors, administrators, representatives, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Obligee, has awarded to Principal, the Amended and Restated Agreement for Roadside Toll Collection System Installation and Maintenance Services, duly executed and delivered as of [_____], 202[] (the “Agreement”), on the terms and conditions set forth therein; and

WHEREAS, as a condition to any final acceptance for each Work Authorization under Article 2, subsection 2.1, and prior to the issuance of the Work Authorization under Article 2, subsection 2.2., Principal is required to furnish a bond guaranteeing payment of claims, subcontractors, suppliers, materialmen and mechanics.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION IS SUCH THAT, if Principal shall fail to pay any valid and timely claims of subcontractors, suppliers, materialmen and mechanics with respect to the Services, then Surety shall pay for the same in an amount not to exceed, in the aggregate, the Bonded Sum; otherwise this obligation shall be null and void upon the conclusion of the term of the Agreement as set forth in Article (7)(d)(iii) of the Agreement.

The following terms and conditions shall apply with respect to this bond:

1. The Agreement is incorporated by reference herein.
2. No alteration, modification or supplement to the Agreement or the nature of the work to be performed thereunder, including without limitation any extension of time for performance, shall in any way affect the obligations of Surety under this bond.
3. Correspondence or claims relating to this bond should be sent to Surety at the following address:

4. This bond shall inure to the benefit of the persons identified above so as to give a right of action to such persons and their assigns in any suit brought upon this bond.

5. To the extent permitted by law, the only permitted claimants under this Bond shall be those entities having a contract with Principal and those entities having a contract with an entity which has a contract with Principal.

6. If any legal action be filed on this bond, venue shall be in Travis County, Texas.

7. This bond is executed in accordance with the provisions of Chapter 2253 of the Texas Government Code, as amended.

8. Initially capitalized terms not otherwise defined herein shall have the definition set forth in the Agreement.

IN WITNESS WHEREOF, Principal and Surety have caused this bond to be executed and delivered as of [_____], 202[_].

Principal:

By: _____

Its: _____

(Seal)

Surety:

By: _____

Its: _____

(Seal)

[ADD APPROPRIATE SURETY ACKNOWLEDGMENTS]

APPENDIX K
Corporate Parent Guaranty

GUARANTY

TO: Central Texas Regional Mobility Authority (“**CTRMA**”)

RE: [____], 202[_] Amended and Restated Agreement for Roadside Toll Collection System Installation and Maintenance Services (the “**Agreement**”) by and between Electronic Transaction Consultants, LLC (“**ETC**”) and CTRMA

FOR VALUE RECEIVED AND TO INDUCE CTRMA TO ENTER INTO THE AGREEMENT, subject to the terms of this Guaranty, Quarterhill Inc. (“**Quarterhill**”), a corporation existing under the laws of Canada and the ultimate parent corporation of ETC, hereby unconditionally and irrevocably guarantees to CTRMA the prompt and complete payment when due, by acceleration or otherwise, of amounts of any lost revenue of CTRMA actually owing by ETC to CTRMA pursuant to the Agreement and caused by the acts or omissions of ETC for those lanes and roads under the supervision and control of ETC or otherwise impacted by ETC, meaning, for clarity, CTRMA will accept revenue from the Electronic Toll Collection System provided and maintained by ETC (the “**Obligations**”). CTRMA understands and agrees that the foregoing is a guaranty of collection only, except as provided hereafter. Quarterhill shall not be required to make any payment under this Guaranty unless and until commercially reasonable attempts by CTRMA to collect from ETC after making proper demand have failed. Notwithstanding the foregoing, in the event of the bankruptcy, insolvency, dissolution or liquidation of ETC, Quarterhill shall be required to perform under this Guaranty and pay amounts claimed without the requirement for any further action to be taken by CTRMA against ETC.

Quarterhill shall not be required to cause any Obligations to be paid unless and until it receives a written demand from CTRMA for performance hereunder (a “**Demand**”) specifying with particularity the unpaid amount and any calculations relating thereto and demanding that Quarterhill pay such unpaid amount pursuant to this Guaranty. Quarterhill shall have no obligation under any Demand or hereunder if and to the extent of any actual payment of the unpaid amount that is received by CTRMA from ETC or any other person prior to the date on which such amount shall be due from Quarterhill pursuant to this Guaranty. Quarterhill shall have 30 days after receipt of a Demand to pay the unpaid amount to CTRMA. With respect to any Demand, Quarterhill shall be entitled to assert any and all rights, remedies and defenses which would otherwise be available to ETC under the Agreement or otherwise; provided, however, that Quarterhill hereby waives and agrees not to assert or take advantage of any defense based upon any voluntary or involuntary bankruptcy, insolvency, reorganization, dissolution, arrangement, readjustment, assignment for the benefit of creditors, composition, receivership, liquidation, marshalling of assets and liabilities or similar events or proceedings with respect to ETC or Quarterhill or any of their respective property or creditors, or any action taken by any trustee or receiver or by any court in any such proceeding.

If this Guaranty shall be placed in the hands of an attorney for collection, demand of payment or should payment be demanded through legal proceedings or through any probate or bankruptcy court, Quarterhill agrees to pay to CTRMA its reasonable attorneys’ or collection fees.

Notwithstanding anything contained in this Guaranty or the Agreement to the contrary, Quarterhill’s aggregate liability hereunder shall not exceed US\$10,000,000.

This Guaranty shall continue in full force and effect until the earliest of: (1) the date on which the Agreement is terminated; or (2) midnight, Central Time on December 15, 2027; **provided**, however, that notwithstanding any such termination, this Guaranty shall continue in full force and effect with respect to any Obligations arising from events that occurred prior to the date of such termination.

This Guaranty shall be governed and construed in accordance with the internal laws of the State of Texas without giving effect to its principles of conflicts of law. Quarterhill and CTRMA expressly agree that venue for any action, litigation or other proceeding of any kind or description (whether in law or equity, in contract or tort, or otherwise) arising out of or in any way relating to this Guaranty shall be brought in federal court of the United States of America located in the Western District of Texas (and any appellate courts thereof) and expressly consent to the jurisdiction of such courts

Any notice, communication, request, demand or other document, required or permitted to be given or sent or delivered hereunder shall be in writing and shall be sufficiently given or sent or delivered if it is delivered personally to the party entitled to receive it by internationally recognized courier or E-mail as follows: (a) to Quarterhill at 25 King Street West, Toronto, Ontario, M5L 2A1 Canada, Attention: General Counsel (E-mail: legal@quarterhill.com); or (b) to CTRMA at _____, Attention: _____ (E-mail: _____). The parties may change their respective contact information contained in this Guaranty by providing written notice to the other party. All notices, communications, requests, demands or other documents given pursuant to this Guaranty shall be deemed to have been received: in the case of a letter, when delivered, if delivered personally (as evidenced by a signed receipt) or sent by internationally recognized courier; and, in the case of an E-mail, on the business day in the jurisdiction of receipt following the business day on which it is sent.

There are no third-party beneficiaries of this Guaranty. This Guaranty may not be assigned by CTRMA without Quarterhill's prior written consent. This Guaranty represents the final agreement between CTRMA and Quarterhill with respect to the matters addressed herein and may not be contradicted by evidence of prior, contemporaneous, or subsequent oral agreements of CTRMA and/or Quarterhill. This Guaranty may not be modified, amended or waived, except in writing signed by duly authorized representatives of each of CTRMA and Quarterhill.

QUARTERHILL INC.

Signed: _____
Name: _____
Title: _____
Date: _____

ACCEPTED BY:

CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

Signed: _____
Name: _____
Title: _____
Date: _____



CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

December 14, 2022
AGENDA ITEM #11

Discuss and consider approving Work Authorization No. 4 with Electronic Transaction Consultants, LLC (ETC) for the design and installation of the toll system and other infrastructure required to support the 183N Mobility Project

Strategic Plan Relevance: Innovation, Service and Stewardship

Department: Operations

Contact: Tracie Brown, Director of Operations

Associated Costs: NTE \$4,469,871.38 (*includes 10% contingency*)

Funding Source: Not Applicable

Action Requested: Consider and act on draft resolution

Project Description/Background: Electronic Toll Consultants, LLC was awarded the 2021 RFP for Electronic Toll Collection System (ETCS) Integration and Maintenance Services. The scope of their work in support of the Mobility Authority includes incremental replacement and maintenance of ETCS equipment on all existing Mobility Authority toll projects, as well as implementation and maintenance of systems on new Mobility Authority projects.

Action Requested: Work Authorization (WA) #4 will include the replacement of toll equipment on the 183 North Mobility Project (“183N”) and associated project documentation updates. The 183N Express Lane implementation project will construct four (4) express lanes (two in each direction) and widen the existing US 183 as required to bring the total number of general purpose (GP) lanes to four (4) in each direction. The Project will also include the construction of direct connector (DC) ramps providing access between the new express lanes on US 183 and the existing express lanes on MoPac Expressway. Intelligent Transportation Systems (ITS) infrastructure to support toll collection of the express lanes in addition to traffic management and incident response will also be included in the Project.

The toll collection system for the project will be all electronic toll collection (ETC). The 183N project limits extend from SH45 North / RM 620 to State Loop 1 (MoPac Expressway). The project length is approximately nine (9) miles. The project consists of five (5) toll sites that provide open road tolling for both the northbound and southbound lanes and shoulders. A two (2) gantry solution will be provided for all tolling locations.

The total cost for the 183N Mobility Project’s toll collection system is \$4,469,871.38. The breakdown for this cost is as follows:

183N Mobility Project Toll Collection Installation Services Cost Information

System Procurement, Installation and Testing Services	\$ 3,007,667.35
Project Management and Testing Services	1,055,858.08
SUBTOTAL - Installation Services	\$ 4,063,519.43
Project Contingency (10%)	406,351.94
GRAND TOTAL	\$ 4,469,871.38

Previous Actions & Brief History of the Program/Project: In December 2022, the Mobility Authority Board approved the amended and restated contract with Electronic Transaction Consultants, LLC for electronic toll collection integration and maintenance services. The initial term of the agreement is six (6) years with an option for two (2) successive two (2) year renewal terms, subject to the approval of the Mobility Authority’s Board of Directors. The total cost for the agreement is not to exceed \$79,720,455. The value covers all toll collection system installation and maintenance services for new projects as well as existing projects as they are replaced.

In February 2022, the Executive Director approved WA #1 for design support services on the 183N Mobility Project. The total amount not to exceed for this work was \$287,971.93.

Financing: 183N construction financing

Action requested/Staff Recommendation: Staff recommends the Board approve Work Authorization #4 with Electronic Transaction Consultants, LLC (ETC) for the design and installation of the toll system and other infrastructure required to support the 183N Mobility Project.

Backup provided: Work Authorization
Presentation
Draft Resolution

**GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY**

RESOLUTION NO. 22-0XX

**APPROVING WORK AUTHORIZATION NO. 4 WITH
ELECTRONIC TRANSACTION CONSULTANTS, LLC FOR DESIGN AND INSTALLATION
SERVICES RELATED TO THE 183 NORTH MOBILITY PROJECT ELECTRONIC TOLL
COLLECTION SYSTEM**

WHEREAS, by Resolution No. 22-0XX, dated December 14, 2022, the Board of Directors approved an Amended and Restated Agreement for Roadside Toll Collection System Installation and Maintenance Services with Electronic Transaction Consultants, LLC (ETC); and

WHEREAS, the Mobility Authority began construction of the 183 North Mobility Project which includes four (4) express lanes (two in each direction) and widen the existing US 183 as required to bring the total number of general purpose (GP) lanes to four (4) in each direction including the construction of direct connector (DC) ramps providing access between the new express lanes on US 183 and the existing express lanes on MoPac Expressway; and

WHEREAS, the Mobility Authority requires services necessary to design and install roadway and civil infrastructure enabling operations of the proposed Electronic Toll Collection System (ETCS) and supporting Intelligent Transportation System (ITS) elements for the 183 North Mobility Project; and

WHEREAS, the Executive Director and ETC have negotiated draft Work Authorization No. 4 in an amount not to exceed \$4,469,871.38 for services related to the 183 North Mobility Project necessary for the design and installation the ETCS and supporting ITS elements; and

WHEREAS, the Executive Director recommends approving Work Authorization No. 4 in the form or substantially the same form as attached hereto as Exhibit A.

NOW THEREFORE, BE IT RESOLVED that the Board of Directors hereby approves Work Authorization No. 4 in an amount not to exceed \$4,469,871.38 with Electronic Transaction Consultants, LLC for services related to the 183 North Mobility Project necessary for the design and installation of roadway and civil infrastructure, enabling operation of the proposed Electronic Toll Collection System (ETCS) and supporting Intelligent Transportation System (ITS) elements in the form or substantially the same form attached hereto as Exhibit A.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 14th day of December 2022.

Submitted and reviewed by:

Approved:

James M. Bass
Executive Director

Robert W. Jenkins, Jr.
Chairman, Board of Directors

Exhibit A



CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

WORK AUTHORIZATION

WORK AUTHORIZATION NO. 04

TOLL SYSTEM IMPLEMENTATION – PHASE II and PHASE III

ELECTRONIC TOLL COLLECTION SYSTEM INTEGRATION AND MAINTENANCE SERVICES

THIS WORK AUTHORIZATION (WA) is made this 14th day of December, 2022 pursuant to the terms and conditions of the Agreement for Roadside Toll Collection System Installation and Maintenance Services, to the amended Contract for Toll System Implementation, dated the 14th day of December, 2022 (the “Contract”) entered into by and between the Central Texas Regional Mobility Authority (the “Mobility Authority” or “CTRMA”), and Electronic Transaction Consultants, LLC (the “TSI,” also referred to in attachments to this WA No. 04 as the “System Integrator” or “SI”). WA No. 04 will include the implementation of toll equipment on the 183N Mobility Project (“183N”) and associated project documentation updates.

PART I. The TSI shall perform system development, implementation, installation, testing and integration services generally described in the Scope of Work attached hereto as **Attachment A**. The TSI’s duties and responsibilities are further detailed in: (1) Project Layouts/Schematics included as **Attachment B**, and (2) the Project Responsibility Matrix included as **Attachment C**

PART II. The maximum amount payable under this WA No. 04 is \$4,469,871.38 including ten percent project contingency . This amount is based generally upon the estimated fees documented in **Attachment D**.

PART III. Payment to the TSI for the services established under this WA No. 04 shall be made in accordance with the Contract.

PART IV. This WA No. 04 shall become effective on the date both parties have signed this WA No. 04. This WA No. 04 will terminate upon the Mobility Authority’s final acceptance of the work described herein as determined by CTRMA or upon payment of the maximum amount payable in Phase II and Phase III, whichever date is first, unless extended as provided by the Contract. The work shall be performed in accordance with the Project Schedule and Milestones as set forth in **Attachment E**.

PART V. This WA No. 04 does not waive any of the parties’ responsibilities and obligations provided under the Contract, as such responsibilities and obligations under the Contract remain in full force and effect.



IN WITNESS WHEREOF, this Work Authorization No. 04 is executed in duplicate counterparts and hereby accepted and acknowledged below.

CTRMA DEPARTMENT DIRECTOR *(Requesting Work Authorization)*

Signature

Date

Typed/Printed Name and Title

CTRMA LEGAL *(Noting Legal Sufficiency)*

Signature

Date

Typed/Printed Name and Title

CTRMA FINANCE *(Noting Funds Availability)*

Signature

Date

Typed/Printed Name and Title

THE TSI (Electronic Transaction Consultants, LLC)

Signature

Date

Typed/Printed Name and Title

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

Executed for and approved by the Central Texas Regional Mobility Authority for the purpose and effect of activating and/or carrying out the orders, established policies or work programs heretofore approved and authorized by the Texas Transportation Commission.

Signature

Date

James Bass, Executive Director

Typed/Printed Name and Title

LIST OF ATTACHMENTS

Attachment A	Work Authorization Scope of Work
Attachment B	Project Layout/Schematics
Attachment C	Project Responsibility Matrix
Attachment D	System Integrator Price Sheet and Budget
Attachment E	Project Schedule & Milestone Payments
Attachment F	Master Project Schedule and Milestones
Attachment G	Project Liquidated Damages/Penalties/Incentives

ATTACHMENT A

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY **TOLL SYSTEM IMPLEMENTATION – PHASE II and Phase III**

ELECTRONIC TOLL COLLECTION SYSTEM INTEGRATION AND MAINTENANCE SERVICES

WORK AUTHORIZATION SCOPE OF WORK

A1.0 GENERAL

A1.01. Background

Electronic Transaction Consultants, LLC was awarded the 2021 RFP for Electronic Toll Collection System (ETCS) Integration and Maintenance Services. The scope of their work in support of the Mobility Authority includes replacement of ETCS equipment on all existing Mobility Authority toll projects, as well as implementation of new systems on new Mobility Authority projects in the Austin, Texas area. WA No. 04 will include the replacement of toll equipment on the 183N and associated project documentation updates.

183N will consist of the construction of four (4) express lanes (two in each direction) and widening of the existing US 183 as required to bring the total number of general purpose (GP) lanes to four (4) in each direction. The Project will also include the construction of direct connector (DC) ramps providing access between the new express lanes on US 183 and the existing express lanes on MoPac Expressway. Intelligent Transportation Systems (ITS) infrastructure to support toll collection of the express lanes in addition to traffic management and incident response, a new shared-use pathway, new sidewalks, cross-street connections for bicyclists and pedestrians along US 183, and other improvements will also be included in the Project.

A1.02. Summary Scope of Work

The Scope of Work for WA No. 04 includes all efforts related to Phase II and Phase III of the ETCS Project as described in the Contract. Phase II and Phase III consists of updating all Program-level documentation specific to 183N and design, testing, installation, and integration of the ETCS on 183N.

A2.0 – GENERAL DESCRIPTION – 183N INFRASTRUCTURE

The Toll Collection System for 183N will be all electronic toll collection (ETC). Phase II of the Project (183N) limits extend from SH45 North / RM 620 to State Loop 1 (MoPac Expressway). The Project length is approximately nine (9) miles. The Project consists of five (5) toll sites that provide Open Road Tolling for both the northbound (NB) and southbound (SB) lanes and shoulders. A two (2) gantry solution will be provided for the site at the locations listed in Table 1 below.

Table 1: Gantry Locations and Lane Counts

Gantry No.	Approximate Station Location	Location	Direction of Travel	No. of Lanes	No. of Shoulders (8' or greater)	Comments (Note that typical section may be different if the location of the gantry is revised.)
1	820+00	South of Lakeline Mall Dr.	SB	1	1	- One (1) 11' express lane - One (1) 10' shoulder
	820+00	South of Lakeline Mall Dr.	NB	1	1	- One (1) 11' express lane - One (1) 10' shoulder
2	7+00	South of McNeil Dr	SB	2	0	- Two (2) 11' express lane - One (1) 4' shoulder
	7+00	South of McNeil Dr	NB	2	0	- Two (2) 11' express lane - One (1) 4' shoulder
3	212+50	South of Capital of Texas Highway/360	SB	1	1	- One (1) 12' express lane - One (1) 10' shoulder
	212+50	South of Capital of Texas Highway/360	NB	1	1	- One (1) 14' express lane - One (1) 10' shoulder
4	212+50	Direct Connectors to/from Mopac	SB	1	1	- One (1) 14' express lane - One (1) 8' shoulder - One (1) 4' shoulder
	212+50	Direct Connectors to/from Mopac	NB	1	1	- One (1) 14' express lane - One (1) 8' shoulder - One (1) 4' shoulder
5	209+00	MoPac	SB	1	1	- One (1) 12' express lane - One (1) 10' shoulder
	209+00	MoPac	NB	1	1	- One (1) 12' express lane - One (1) 10' shoulder

A3.0 GENERAL REQUIREMENTS - TOLL COLLECTION SYSTEM

A3.01 General Requirements – 183N Toll Collection System

The Scope of Work for WA No. 04 includes implementation of an ETCS for Phase II and Phase III that includes roadside functionality (Automatic Vehicle Identification (AVI), Automatic Vehicle Classification and Detection (AVC/D), Violation Enforcement System (VES), Digital Video Audit System (DVAS)), Variable Toll Message Sign (VTMS) components, Closed-Circuit Television (CCTV) and traffic speed, volume and density detection equipment, fiber optic communications, network communication equipment, power systems, and lighting and grounding protection. All field devices will be integrated with the central management software via communication with the Traffic Incident Management Center (TIMC).

The SI shall be responsible for all aspects of system design, testing, procurement, installation/implementation, integration, and training required to support the 183N toll collection system. The Toll Facility Host (TFH) for this WA No. 04 includes trip building and dynamic pricing functionality. The ETCS will integrate with the Mobility Authority's Data Platform System (DPS), which connects to the Mobility Authority's Pay by Mail system and the Central US Interoperability (CUSIOP) Hub.

The Mobility Authority's ETCS, which is being designed and implemented through individual and separate work authorizations for each toll road facility, will replace the legacy ETCS that has been implemented on the 183A Toll Road, 290 Toll Road, 71 Toll Lane, 45SW Toll Road, 183 South Toll Road, and the MoPac Express Lane, as well as integrate to the DPS and TIMC. It is required that the ETCS be interoperable with the other CUSIOP agencies through the CUSIOP Hub.

A4.0 EQUIPMENT, INSTALLATION, AND TRANSITION

A4.01. Gantries and Roadside Equipment for ETCS

The SI shall provide, install, and test all equipment, systems, subsystems, documentation, and components to comply with the requirements of Phase II and Phase III of the Contract for the following:

- Roadside systems, subsystems, and infrastructure to support AVI, AVC/D, VES (cameras), DVAS (cameras), CCTV cameras, zone controllers, equipment monitoring, diagnostic systems, configuration, software, all related/required components and sensors, validation of roadway infrastructure, including modification of infrastructure (if required), and development of installation drawings and installation plan.
- A dynamic pricing engine/system that calculates and provides toll rates based on traffic conditions in the express lanes and GP lanes.
- Appropriate applications to support daily operations of CTRMA's facilities.
- Processing, tracking, and storing all transactions generated by roadside tolling equipment.
- Complete image processing to provide license plate information from images captured

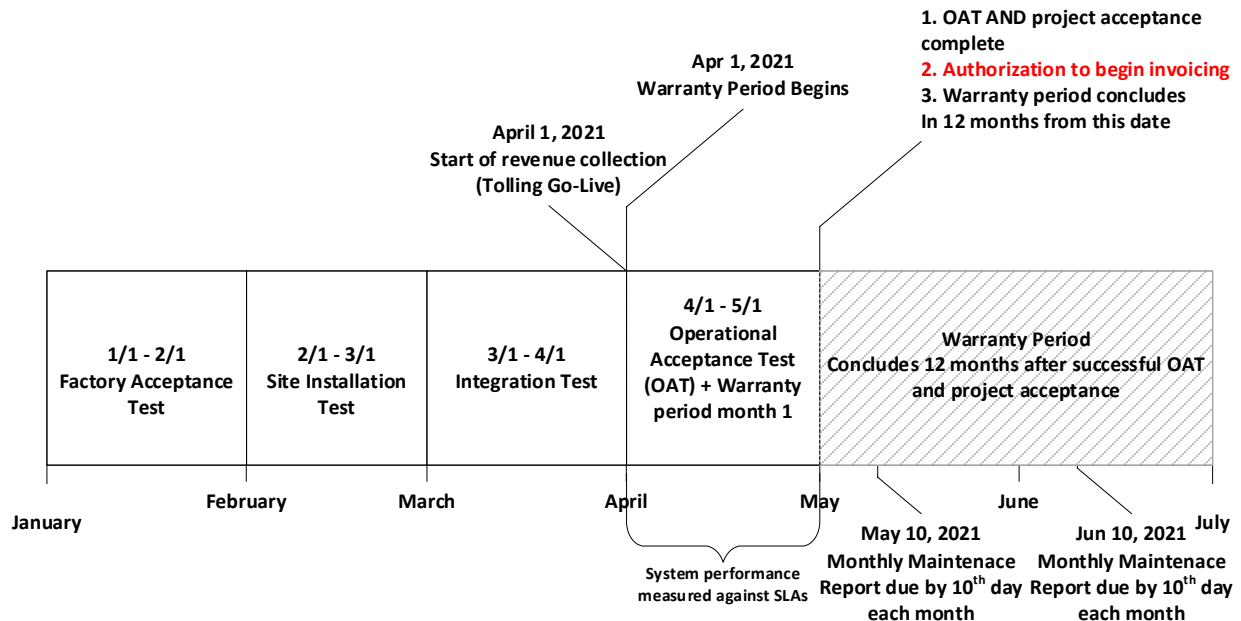
on the roadside, including all systems, and required operations staff.

- Project management including Project schedules, Project meeting organization (including agendas and notes), Project level documentation, requirements workshops, quality assurance and control programs, risk management, and coordination with CTRMA and their designated staff, consultants, partners, and vendors. All documentation is to be submitted to CTRMA for review and approval based on a mutually agreed upon, approved schedule.
- The warranty period concludes 12 months after CTRMA approval of the Operational Acceptance Test (OAT) and project acceptance. An example of the warranty period is presented below in Figure 1 which illustrates the required sequence of each milestone. Additional examples are provided in Section 2.13.6 of Appendix A of the Contract.

The TSI shall be given full project acceptance and authorization to initiate maintenance invoicing for the ETCS, either a newly installed or transitioned facility, upon the completion and the CTRMA approval of the OAT for that project/facility, closure of all punch-list items, completion, and submission of all required documents, including as-builts and updates to manuals and meeting of other conditions as specified in the Contract. Work performed prior to authorization to initiate maintenance invoicing is not considered maintenance, even though the project may be open to revenue collection.

Note: Figure 1 represents the completion of OAT and full project acceptance thirty (30) days after go-live.

Figure 1: Example Warranty Period



- Procurement and receipt of all ETCS hardware and coordination with the Mobility Authority for equipment validation and asset tag application.
- Security of all procured and paid for ETCS hardware until installed. CTRMA shall

receive a full manufacturer’s warranty on all procured hardware equipment during the Warranty Period.

- Development of user manuals and training for SI-provided systems, software, and reports.
- Network administration of all ETCS communications equipment, software, cables, connections, configurations necessary to operate the ETCS.
- Transition plan and approach for the transition of system elements and facilities from the existing SI’s solution to the new ETCS, particularly focused on business continuity and mitigation of revenue loss.
- Training program designed to educate CTRMA-designated personnel in the operation, use, and maintenance of the ETCS.
- ETCS Project documentation including the Requirements Traceability Matrix, Interface Control Documents (ICDs), System Detailed Design, Disaster Recovery, and Backup, Recovery and Data Archive plan.
- System testing plan/script and documentation including Master Test Plan, Test Reports, Site Installation Testing, Integration Testing, and Operational Acceptance Testing.
- Succession plan to define the SI’s approach in supporting the transition of their responsibilities under this contract to CTRMA and/or another entity whenever this contract terminates.

More detailed requirements for these systems and subsystems are described in Sections 2.4, 2.5, 2.6, 2.9, 2.11, 2.12, 2.13, 2.14, 2.15, 2.17, 2.18, 2.19 of Appendix A of the Contract.

A5.0 PROJECT COORDINATION, MANAGEMENT AND COMMUNICATION

The SI shall be responsible for all required coordination efforts and touchpoints with CTRMA and Project stakeholders throughout the term of the Project, including building and maintaining relationships and direct lines of communication between the Mobility Authority and other Project stakeholders as identified by the Mobility Authority.

Anticipated SI coordination efforts, touchpoints, and responsibilities throughout the Project, include, but are not limited to:

- Project kick-off meeting
- Project progress meetings as required
- Comment resolution meetings to review all submissions, workshops to validate system requirements, design approach and design, product demonstrations, report formats, test plans and scripts, and other issues requiring coordination between CTRMA and the SI.
- Ad-hoc design review meetings
- Design/development demonstrations
- Installation meetings

- Coordination with Kapsch and CTRMA regarding transition of roadways and the transition of maintenance from Kapsch to ETC
- Test script execution and demonstrations
- Coordination with other system providers that integrate to CTRMA's existing ETCS
- OAT readiness meeting and all other testing readiness meetings
- Development of various documents and tools to communicate Project status, installation requirements, or other critical aspects of the Project, including but not limited to:
 - Requirements Traceability Matrix
 - Installation plans and drawings
 - Schedule
- Communicating requirements needed from Mobility Authority and Project stakeholders for system testing

A6.0 TOLL FACILITIES RESPONSIBILITY MATRIX

The delineation of Project responsibilities between the SI and the Mobility Authority is presented in ATTACHMENT C Project Responsibility Matrix.

A7.0 INSTALLATION PERFORMANCE AND PAYMENT BOND

Prior to the beginning of any work designated in this WA No. 04, the TSI shall provide, and continuously maintain in place for the benefit of CTRMA, an installation performance bond and payment bond in the form of Appendix J of the Contract as stipulated in Article 7 of the Contract.

A8.0 INSURANCE

Prior to the beginning of any work designated in this WA No. 04, the TSI shall obtain and furnish Certificates of Insurance (COI) as stipulated in Article 19 of the Contract.

[END OF SECTION]

ATTACHMENT B

Project Layout ELECTRONIC TOLL COLLECTION SYSTEM INTEGRATION AND MAINTENANCE SERVICES



ATTACHMENT C

Project Responsibility Matrix ELECTRONIC TOLL COLLECTION SYSTEM INTEGRATION AND MAINTENANCE SERVICES

Table C-2: Responsibility Matrix for CTRMA and System Integrator (SI)

Primary Responsibility: P	Support Responsibility: S		Coordination Responsibility Only: C			No Responsibility: N	
Element/Task/Component/ Sub-system	DB Contractor (DB)			System Integrator (SI)			Comments Other Responsibility/Information
	Design	Procure	Install/ Construct	Design	Procure	Install / Construct	
GENERAL REQUIREMENTS							
Schedule	P	P	P	S	C	S	DB shall accommodate and incorporate the SI scheduled activities into the DB schedule. All schedule changes or updates which impact the SI tasks must be agreed to by the SI prior to submittal to the Mobility Authority. A monthly schedule must be distributed and incorporate any SI updates or changes.
Request for Early Opening	P	P	P	S	S	S	The SI must be able to match schedule request for early opening. SI must be allowed early unencumbered access in order to meet early opening request.
Design Package – Installation and Electrical Design and Plans	P	P	P	C	N	C	DB to incorporate all toll and ITS requirements and specifications into all versions of the Structural and Electrical Design Packages. SI to provide DB approval of packages prior to issuance of Released For Construction (RFC) plans. DB will coordinate installation activities with SI.
Grading	P	P	P	C	N	C	DB to incorporate SI requirements with respect to grading into toll and ITS system design. DB to place infrastructure with ease of maintenance access and installation as a priority.
Drainage	P	P	P	C	N	C	No culverts or pipes under toll zones.

Table C-2: Responsibility Matrix for CTRMA and System Integrator (SI)

Utilities/Electrical Services	P	P	P	S	C	C	SI to provide specific requirements for the Toll and/or Mobility Authority ITS Systems. DB to incorporate into the ITS and toll facilities design, and construct power, utilities interface, and all power infrastructure. DB to provide power to the Toll System pad and Mobility Authority ITS locations as required by the SI. SI to terminate power to toll and ITS sites owned by the Mobility Authority.
Traffic Control/Safe work zone	P	P	P	S	N	C	SI to provide DB detailed lane closure requirements, schedule for installation and testing of tolling and Mobility Authority ITS equipment. DB to provide traffic control devices, and safe working conditions for SI during installation and testing of all toll and Mobility Authority ITS equipment.
Field Office requirements	P	P	P	C	N	C	DB shall coordinate with the SI on space requirements for design and construction personnel.
Signing	P	P	P	C	N	S	All toll signing must be coordinated with and approved by the Mobility Authority. If toll price signs utilize changeable electronic signs, the DB will provide the static sign and the SI will provide the electronic insert (e.g. LED panels) and wireways needed to integrate the system. DB shall be responsible for coordinating with the SI to allow SI to install LED panels and wire ways on static signs while on the ground, at the roadside location, prior to mounting signs onto sign gantry/truss.
Striping	P	P	P	S	N	C	DB to coordinate with SI to identify final striping within the toll zone for the SI's loop (and/or other sensors/equipment) installations.
Lighting	P	P	P	S	C	S	Roadway and toll location lighting provided by DB. SI to provide lighting requirements in vicinity of toll locations and locations of other Toll System equipment. DB to confirm that lighting does not obstruct toll related signing or impede the Toll System.
Landscaping	P	P	P	C	N	N	

Table C-2: Responsibility Matrix for CTRMA and System Integrator (SI)

Fencing/Guardrail/Bollards/Concrete Barrier	P	P	P	S	C	C	SI to provide specific requirements for the toll pad placement, access and security fencing and/or barriers around toll and ITS equipment. DB to provide fencing and/or barriers at all toll pads per SI requirements. DB to install the appropriate barrier to protect toll pad equipment from traffic per SI requirements. DB to incorporate design requirements into design packages. DB to coordinate with SI to review and approve all versions of design packages.
Locations and Layouts	P	P	P	S	C	C	SI to provide requirements for specific lane and facility layouts. DB to incorporate into Design Packages. DB to coordinate with SI to review all versions of design packages. SI to review and approve locations for the toll and ITS systems owned by the Mobility Authority. The DB will coordinate with SI during infrastructure installation activity.
Gantries/Foundation/Trusses/Junction boxes/Conduits/Grounding	P	P	P	S	C	S	SI to provide requirements for conduits (for SI installed power and communications cables, including specific requirements for below ground conduits for the loops), junction boxes, and power needs for the toll and ITS systems owned by the Mobility Authority. DB to incorporate into structural design, including electrical grounding, bonding, and power conductors. DB to provide and install gantry/truss for toll systems, gantry/truss foundations, junction boxes, cable trays/conduits/wireways, pull strings and bell ends for all conduits up to one foot above pole foundations and for conduits going up gantry columns. The DB will require SI to sign off on below-ground conduit stub outs pertaining to all toll and ITS facilities prior to finalizing toll zone pavement, toll equipment pads and foundations related to ITS installation.
Equipment Mounts on Brackets/Frames	S	N	C	P	P	P	SI to procure and install equipment for the toll and ITS systems owned by the Mobility Authority, and related cable and wiring, including communications from roadside cabinets to the equipment mounted on the gantries. SI to provide requirements for all brackets and frames needed to attach SI procured equipment to DB provided truss. SI to provide requirements for toll hanger, and the orientation of hangers mounted to Gantries. DB to furnish and install all toll hangers per SI requirements.

Table C-2: Responsibility Matrix for CTRMA and System Integrator (SI)

Equipment Brackets/Frames on Gantries	P	P	P	S	N	C	DB is to provide and install all toll hangers/brackets/frames on DB provided toll gantry/truss needed to attach all SI procured equipment. SI to provide locations for installation to the DB. DB to coordinate with SI to review hanger
Variable Toll Message Sign (VTMS) camera infrastructure (foundations (if needed), conduits, grounding, camera poles, and electrical services)	P	P	P	S	C	C	SI to provide requirements for camera mounts, conduits, junction boxes, power and data wiring and cables. SI shall also specify the locations of the VTMS controllers and cameras. SI to also provide requirements for placement with respect to maintenance access. DB to incorporate design requirements into Design Packages. DB to coordinate with SI to review all versions of design packages. SI to review and approve VTMS camera locations and infrastructure. DB to provide and install sign truss, truss foundations, poles, junction boxes, conduits, conduit pull strings, bell ends for all conduits, power circuit and power cable to the SI's cabinet.
VTMS cameras installation	S	N	C	P	P	P	SI to procure, install and terminate all cabinets and cameras, including all wiring except for the primary branch power circuit to the site's cabinet. SI shall also be responsible for testing VTMS camera systems.
Traffic Detection System (TDS) and Closed Circuit Television (CCTV) Camera installations	S	C	S	P	P	P	SI to procure, install and terminate all cabinets and traffic detection sensors, including all wiring except for the primary branch power circuit to the site's cabinet. SI shall also be responsible for testing TDS and CCTV systems.
TDS and CCTV Camera infrastructure: (Pole/Post-Mounts, supports, wiring and	P	P	P	C	C	S	SI to provide requirements for placement with respect to maintenance access. DB to incorporate design requirements into Design Packages. DB to coordinate with SI to review all versions of design packages. SI to review and approve TDS and CCTV locations and infrastructure.

Table C-2: Responsibility Matrix for CTRMA and System Integrator (SI)

Dynamic Message Sign (DMS) infrastructure: (foundations, conduits, grounding, DMS support structure, and electrical services)	P	P	P	S	C	C	SI to provide requirements for DMS dimensions (including single line DMS), mounts, conduits, support structure, power and data wiring, and cables. SI to provide requirements for placement with respect to maintenance access, power requirements, and weight of anticipated equipment for structural design purposes. DB to incorporate design requirements into Design Packages. DB to coordinate with SI to review all versions of design packages. SI to review and approve DMS locations and infrastructure. DB to provide and install support structure and foundations, conduits, junction boxes, vertical mounting supports, and power cables to the sign's main breaker.
DMS installation	S	N	S	P	P	P	SI to procure, install and terminate DMS (including single line DMS "bricks"), including all communication to the DMS. SI to terminate power circuit to the sign. SI shall also be responsible for testing DMS systems.
Automated lane closure gate system infrastructure: (foundation requirements, grounding, conduits, mounting/support structure, poles, and electrical services (as needed/required))	P	P	P	S	C	C	SI to provide requirements for gate system, including placement of each automated lane closure gate, mounting requirements/support structure, power and communication wiring, poles, foundations, conduits, junction boxes, power and data wiring, and cables. SI shall also specify the locations of the gate system, and placement with respect to maintenance access. DB to incorporate design requirements into Design Packages. DB to coordinate with SI to review all versions of design packages. SI to review and approve gate system locations and infrastructure. DB to provide and install foundations, junction boxes, conduits, conduit pull strings, bell ends for all conduits, power circuit and power cable to the SI's cabinet. DB shall also provide and install gate system equipment, including but not limited to: cabinets, poles, gate arms, etc.
Automated lane closure gate system installation (e.g. dedicated short-range communications)	S	C	C	P	P	P	SI to install, configure and test equipment (e.g. hardware, software, etc.) and systems needed to operate the gate system. SI to terminate all wiring (power and communications) except for the primary

Table C-2: Responsibility Matrix for CTRMA and System Integrator (SI)

(DSRC), Bluetooth and/or Wi-F) installations							
RSU infrastructure: (Pole/Post-Mounts, supports, wiring and cables)	P	P	P	C	C	S	SI to provide requirements for placement with respect to maintenance access. DB to incorporate design requirements into Design Packages. DB to coordinate with SI to review all versions of design packages. SI to review and approve RSU locations and infrastructure. DB to provide and install poles, pole foundations, junction boxes, conduits, conduits pull strings, bell ends for all conduits, power circuit and power cable to the SI's cabinet.
Pavement structure, including special nonferrous zones and conduit stub-outs for in-pavement sensors/loops	P	P	P	S	N	C	SI to provide requirements for special pavement structures at toll and ITS locations. DB to incorporate design requirements into Design Packages. DB to coordinate with SI to review all versions of design packages. SI shall coordinate joint spacing to avoid conflicts with loop placement, and sign off on riser locations before concrete pour. DB to assure ferrous objects (i.e. rebar, grates, pipes, etc.) are not in the toll system's zone of influence. DB to locate loop risers after pavement is poured.
EQUIPMENT CABINETS							
Toll Equipment Cabinets	C	N	S	P	P	P	SI to provide size and number of cabinets needed for Mobility Authority Toll and ITS systems. DB shall incorporate location into site grading and drainage design. SI to procure and install environmentally controlled cabinets for ITS and toll systems owned by the Mobility Authority. The environmentally controlled enclosures provided by SI must comply with the America Society of Heating, Refrigeration, and Air Conditioning Engineers: Thermal Guidelines for Data

Table C-2: Responsibility Matrix for CTRMA and System Integrator (SI)

Toll Equipment Cabinet Site (TEC) and Roadside Equipment Cabinet Base Slabs	P	P	P	S	N	C	SI to provide requirements for specific equipment weight and anchorages for all cabinets, generators, and auxiliary fuel tanks to the DB for all toll and ITS locations. DB to incorporate into design packages, and coordinate with the SI for review and approval. DB to coordinate with SI to verify conduit installations prior to concrete pours at all locations.
Security Communications at Toll System locations	C	N	C	P	P	P	SI to provide security communications for all toll and ITS system equipment.
TOLL SUB-SYSTEMS							
Automatic Vehicle Identification (AVI) Antennas and Readers	N	N	S	P	P	P	SI to procure and install AVI antennas and readers, system mounts, wiring and cables. SI will perform all AVI system installation and terminations, and to make the connections to the electronics in the cabinets.
Automatic Vehicle Classification and Detection (AVC) and (AVD)	N	N	S	P	P	P	SI to install, connect and terminate AVC and/or AVD systems mounted on the gantries and/or installed in the pavement to the electronics in the cabinets.
In-Pavement Sensors	N	N	S	P	P	P	SI shall procure, install (e.g. saw cut pavement) and seal pavement sensors with approved sealant. DB to assure ferrous objects (i.e. rebar, grates, etc.) are not in the toll system's zone of influence. DB to assure longitudinal and transverse pavement joints in the non-ferrous pavement section in the toll zone do not conflict with SI conduit stub-up array in pavement section. DB to coordinate with SI to validate striping with pavement loop locations. DB to coordinate with SI and provide the SI with traffic control and access to toll zones for loop (and/or other sensors/equipment) installations prior to any final overlay paving (e.g. PFC).

Table C-2: Responsibility Matrix for CTRMA and System Integrator (SI)

Video Capture Sub-System (VCS/VES) Cameras, Illumination, Sensors and Servers	N	N	S	P	P	P	SI to provide and install Video Capture Sub- System (VCS/VES) cameras, illumination enclosures, mounts, camera wiring and cables. SI to connect and terminate VCS/VES cameras, illumination, sensors and servers. SI to make the connections to the electronics in the cabinets.
In-Lane Processing Servers and Electronics	N	N	N	P	P	P	SI to provide, install, connect, and terminate all electronics in the cabinet, and assure proper communications to the devices on the gantry and/or in the pavement.
VTMS Message Panels and Controllers	N	N	S	P	P	P	SI to provide, install, connect, and terminate VTMS message LED panels and controllers, including wireways, communication wiring and power wiring from the VTMS to the controllers in the cabinet. SI to provide VTMS LED panel sizes to the DB to be incorporated into the large guide sign design. DB shall be responsible for coordinating with the SI to allow SI to install LED panels and wire ways on static signs while signs are on the ground, at the roadside location, prior to mounting signs onto sign gantry/truss.
POWER DISTRIBUTION SUB-SYSTEM							
Metered power service at each toll and ITS location	P	P	P	C	N	C	DB is responsible for metered power service for all toll and ITS locations. DB to procure and install electric service poles, and coordinate activation of power service with service provider. DB to provide all branch circuit breakers, and terminate all branch circuits at the service panel. DB to provide and install necessary conductors, ducts and junction/pull boxes, bell ends/pull strings and disconnect switch/fuse at the meter.

Table C-2: Responsibility Matrix for CTRMA and System Integrator (SI)

Metered power service at each location	C	N	C	P	P	P	SI to provide power requirements and special requirements for construction of utilities near each Toll and ITS System. DB to incorporate design requirements into Design Packages. DB to coordinate with SI to review all versions of design packages. SI shall provide and install all other wiring, switches, surge protection/suppression, etc. for power from the ATS at the toll pad for the Toll System equipment and other locations for ITS equipment. SI will terminate all power wiring for all branch circuits off the Service Panel to the Toll or ITS Site.
Generators and Automatic Transfer Switches (ATS)	S	N	C	P	P	P	SI to provide generators, ATS, generator cabinets, wiring, connect and terminate all power at roadside toll equipment locations.
Generator Power Source is Natural Gas	P	P	P	S	N	C	If natural gas is available, the DB shall provide, install and incorporate the gas lines into the roadway design. SI to coordinate and provide generator requirements including location for gas feed.
Generator Power Source is propane or diesel	S	S	S	P	P	P	If propane is used, DB will provide pad and conduit feed for propane fuel tank (10' minimum from generator). The SI shall provide and install the propane tank for the generator if natural gas is not a viable option for the project.
Uninterruptible Power Supplies (UPS)	S	N	C	P	P	P	SI to provide and install Uninterruptible Power Supply Systems (UPS) in the cabinets. UPS will be required for the Toll Systems, WWD systems, DMS, VTMS and VTMS Cameras. SI will install all necessary wiring for the UPS. TDS, automated gate systems and CCTV Cameras (non-VTMS Cameras) will not require a UPS.

Table C-2: Responsibility Matrix for CTRMA and System Integrator (SI)

Lightning Protection & Grounding	P	P	P	S	C	C	<p>SI to provide specific requirements for Toll and ITS systems equipment lightning protection and grounding. DB to incorporate design requirements into Design Packages. DB to coordinate with SI to review all versions of design packages.</p> <p>DB to furnish and install required lightning protection and grounding.</p>
COMMUNICATIONS SUB-SYSTEMS							
Conduits/Ducts and Junction/Pull Boxes/Outlets	P	P	P	S	C	S	<p>SI to provide specific communications design requirements including location of long-radius sweep conduit bends. DB to incorporate design requirements into Design Packages. DB to coordinate with SI to review all versions of design packages.</p> <p>DB to install conduits, junction boxes, bell ends with pull strings. The DB Contractor shall verify that all duct bank and conduits are clear/proofed and have pull strings available to the SI for installation of communications cables at least 30 days prior to the beginning of the toll system installation.</p>
Fiber Optic cabling in conduits for Toll System and Toll-related ITS Elements	S	S	S	P	P	P	<p>SI to provide fiber requirements for toll and ITS systems. DB to incorporate design requirements for duct back/conduit backbone and laterals into Design Packages. DB to coordinate with SI to review all versions of design packages.</p> <p>SI to furnish and install fiber along the corridor to toll and ITS cabinets for Mobility Authority equipment. SI shall be responsible for testing all SI-installed fiber after installation.</p>

Table C-2: Responsibility Matrix for CTRMA and System Integrator (SI)

Toll Hardware in Cabinets and Computer Rack System	C	N	C	P	P	P	SI to provide and install all toll hardware within the cabinets. Equipment must be installed in a clean and organized manner and must not be affected by the environmental controls. The SI must provide and install the redundant environmental controls. SI to provide and install computer system racks to house the communication equipment including environmental controls.
Routers	C	N	C	P	P	P	SI to provide, install and configure the routers for connection from hub locations to the Mobility Authority's Traffic and Incident Management (TIM) Center.
Switches	N	N	C	P	P	P	SI to provide, install and configure the switches for connections from tolling and ITS locations to hub locations.
Firewalls	N	N	C	P	P	P	SI to provide, install and configure the necessary firewall for the toll system and ITS system. The toll and ITS systems shall be kept separate from each other and any other systems that utilize the TxDOT Hubs.
Patch/Distribution Panels	N	N	C	P	P	P	SI to provide and install all the necessary patch and distribution panels to provide a Fault Tolerant Single Mode Fiber Optic IP-Based Communication System.
Corridor Communications System	S	N	C	P	P	P	SI to provide Fault Tolerant Single Mode Fiber Optic IP-Based Communication System for toll systems.
Corridor Communications Conduits	P	P	P	C	N	S	DB to provide branch conduit to the TxDOT duct bank system, including all that is necessary to furnish and install conduit, ground boxes, and terminations
Corridor to Traffic and Incident Management (TIM) Center	N	N	N	P	P	P	SI to provide Fault Tolerant IP-Based Communication System to the TIM for toll and ITS systems.

Table C-2: Responsibility Matrix for CTRMA and System Integrator (SI)

Data/Communications Service to each Tolling Location	N	N	S	P	P	P	SI to provide system design plans indicating power and communications/data requirements. SI to install any power and communications cable required to interface between the toll cabinet and the communications service provider's POI. DB is responsible for the conduit infrastructure to provide a raceway from the toll pad to the service POI.
SYSTEMS SERVERS AND SPACE							
Systems Servers and Workstations	N	N	C	P	P	P	SI to provide, install and configure all system servers and workstations required at the TIM Center to support the operations and management of the Express Lanes.
Federal Communication Commission License Preparation and Submission	C	N	N	P	P	P	SI to provide all information necessary to acquire FCC Licensing to the Mobility Authority.
DUCT BANK AND MOBILITY AUTHORITY INTELLIGENT TRANSPORTATION SYSTEMS (ITS)							
New Duct bank	P	P	P	C	C	C	SI to provide requirements for new duct bank. DB to incorporate design requirements for duct back/conduit backbone and laterals into Design Packages. DB to coordinate with SI to review and approve all versions of design packages.
Fiber Installation	N	N	C	P	P	P	SI to provide, install and test the fiber for toll and ITS systems owned by the Mobility Authority.
Duct Bank Adjustment and IT relocations design	P	P	P	N	N	N	DB is responsible for the design, relocation and replacement of existing TxDOT-owned ITS including, foundations, conduits, electrical services, grounding circuits, and support structures. DB responsible for adjusting existing duct bank junction/ground boxes and providing new junction/ground boxes. Coordination with TxDOT will be required.

Table C-2: Responsibility Matrix for CTRMA and System Integrator (SI)

Duct Bank Adjustments/new connections	P	P	P	S	N	C	DB is responsible for all adjustments and new junction/ground box ties.
Fiber optic cables	P	P	P	N	N	N	Any adjustments to and replacement of existing cables are DB responsibility. Testing of TxDOT-owned ITS is the DB's responsibility.
New or Replacement CCTV cameras, communications and equipment enclosures	P	P	P	S	N	C	DB to procure, install and terminate TxDOT-owned CCTV equipment, including cameras, camera controls, cables (power and communications), and connections compatible with TxDOT's Lonestar system. DB Contractor shall provide all the equipment necessary for TxDOT's control of all CCTV cameras. The method of control shall be in accordance with TxDOT Engineering Standard Sheets and TxDOT Standard Specifications. DB shall also be responsible for testing TxDOT-owned CCTV camera systems.
Relocation of existing CCTV and DMS foundations, conduits, grounding, camera poles, and electrical services	P	P	P	C	N	C	DB is responsible for relocating any existing CCTV and DMS structures and electrical services impacted by the Project Design, including communications and power. Damaged or inoperable equipment shall be removed, but not repaired. DB shall coordinate with TxDOT regarding proper storage of existing devices until time of reinstall.
Existing and new vehicle detector foundations, conduits, grounding, vehicle detector support structures, and electrical services	P	P	P	N	N	N	DB shall abandon any existing vehicle detectors/loops within the pavement within the Project limits.
Vehicle detectors, communications, and equipment enclosures	P	P	P	C	N	C	DB is responsible for the procurement, installation and placement of new vehicle detectors. DB to coordinate with TxDOT regarding the placement of the detectors. DB shall provide power and communications to the vehicle detection equipment. DB to incorporate design requirements for vehicle detectors into Design Packages. DB to coordinate with Mobility Authority and TxDOT to review all versions of design packages.

Table C-2: Responsibility Matrix for CTRMA and System Integrator (SI)

Maintenance of ITS During Construction	P	P	P	C	N	C	<p>DB responsible for maintaining, restoring and protecting any existing ITS functionality, including those owned by TxDOT or local Governmental Entities, on the Project until Final Acceptance except during system maintenance, crossovers, or other periods approved by the Mobility Authority. For existing ITS impacted by the Project, DB required to develop and submit an ITS Implementation Plan as a part of the Intermediate (65%) Design Submittal outlining the interim and final locations of all communications infrastructure and field devices on the Project. DB responsible for procuring, installing and testing temporary wireless radio connections to maintain communications links for all existing TxDOT-owned ITS during construction.</p> <p>During construction of the Project, DB responsible for the repair of each existing communication cable, downed communications link, or electrical conductor that is severed or otherwise rendered not usable within:</p> <ul style="list-style-type: none"> • 4 hours if a major/backbone/trunk line. • 8 hours if a minor/drop fiber line.
Communications Network	P	P	P	C	N	C	<p>For TxDOT communications infrastructure on the Project, DB is responsible for providing a communications network that has redundant routing capabilities. The communications network shall serve the highway ITS components along the highway Elements of the Project. Where necessary, as determined by TxDOT, DB shall provide ITS communications hubs/cabinets to support the communications network. DB shall provide all the equipment necessary for the TxDOT communications network.</p>
Testing relocated ITS equipment	P	P	P	C	N	C	<p>DB is responsible for all system testing (e.g. acceptance and end-to-end testing) for new, replacement or relocated TxDOT-owned ITS equipment along the corridor. DB is responsible for coordinating testing with the Mobility Authority to ensure that there will be no conflicts between the Mobility Authority, TxDOT, their affiliated contractors, and DB Contractor's staff. DB is responsible for maintenance of traffic and traffic control during system testing.</p>

Table C-2: Responsibility Matrix for CTRMA and System Integrator (SI)

Responsibility Assignment Legend							
Primary Responsibility: P	Support Responsibility: S		Coordination Responsibility Only: C			No Responsibility: N	
Element/Task/Component/ Sub-system	CTRMA			Systems Integrator (SI)			Comments Other Responsibility/Information
	Design	Procure	Install/ Construct	Design	Procure	Install / Construct	
GENERAL REQUIREMENTS							
Project Management and Documentation	C	N	N	P	P	P	SI responsible for developing all required documentation deliverables by the agreed upon schedule dates, building in time to allow the CTRMA adequate time to review and approve documents, and submitting them for CTRMA's review and approval. CTRMA to provide approval of documents prior to system design.
System Design Documents	S	N	N	P	P	P	SI responsible for developing all required documentation deliverables by the agreed upon schedule dates, building in time to allow the CTRMA adequate time to review and approve documents, and submitting them for CTRMA's review and approval. CTRMA to provide approval of design packages prior to system testing and implementation.
Schedule	S	N	N	P	P	P	The SI is responsible for developing a comprehensive project schedule capturing all work items and activities needed to fully implement the toll system. The SI shall be responsible for updating and distributing an updated schedule monthly (or upon a duration as directed by CTRMA) that incorporates any SI updates or changes from the last schedule update. The SI shall be responsible for coordinating with outside entities or other project stakeholders, as determined by the Mobility Authority, to incorporate third-party tasks into the SI's schedule that may impact delivery of the toll system

Table C-2: Responsibility Matrix for CTRMA and System Integrator (SI)

ELECTRONIC TOLL COLLECTION SYSTEM							
Determination of existing toll equipment, infrastructure, buildings, and communication reuse	C	C	C	P	P	P	Unless explicitly stated otherwise, the SI may reuse any or all equipment currently installed, subject to the limitations of the approved transition plan.
Toll Equipment	S	N	S	P	P	P	SI to provide all tolling equipment. If SI reusing existing toll equipment, SI shall certify existing equipment will meet all required SLAs. SI is responsible for all aspects of the design, development, testing and implementation of the toll equipment as described in the master contract and this WA No. 4.
Dynamic Pricing Engine (DPE)	S	N	N	P	P	P	The SI shall be responsible for the delivery and implementation of a DPE to support the dynamic calculation and display of toll rates through VTMS. The SI-provided DPE is responsible for the calculation and accuracy of the dynamic toll rates at a user-configurable interval using speed, volume, and density of the traffic.
Data Platform System (DPS)	S	N	S	P	P	P	SI to integrate with CTRMA's DPS for transmission and reconciliation of toll transactions and images, as described in the master contract, this WA No. 4 or third-party system design documents (i.e., ICD).
Transition of Facilities	N	N	C	P	P	P	SI to submit a Transition Plan to CTRMA for review, comment, and approval before the start of any transition activities.
Testing	S	N	C	P	P	P	SI to conduct testing of the ETCS to validate functionality, availability, reliability, accuracy, and compliance to the requirements detailed in Appendix A of the Contract or changes to any requirements due to change orders or break/fix activities. The SI is responsible for documenting all test plans and procedures/scripts and submitting them for the Mobility Authority's review and approval prior to testing.
Training	S	N	C	P	P	P	SI to provide training designed to educate CTRMA-designated personnel in the operation, use, and maintenance of the ETCS. The SI is responsible for all training documents and materials as described in the master contract

Table C-2: Responsibility Matrix for CTRMA and System Integrator (SI)

							and submitting them for the Mobility Authority's review and approval prior to training.
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ATTACHMENT D

System Integrator Price Sheet

ELECTRONIC TOLL COLLECTION SYSTEM INTEGRATION AND MAINTENANCE SERVICES

SECTION / LINE		DESCRIPTION	WA 4 Quantity	WA 4 Price
B2	16	Open Road Toll Collection – Future Facilities New Construction w/ In-Ground		
	18	One lane + one shoulder	8	
	20	Two lanes + one shoulder	2	
B4	27	Plaza Server		
	28	Plaza Server	1	
B5	29	ORT Roadside Equipment Cabinet		
	30	Toll Zone	5	
B6	31	Dynamic Pricing		
	32	Variable Toll Message Sign Components, associated CCTV, & Cabinet	6	
	33	Traffic Speed, Volume, and Density Detection Site w/Cabinet	60	
B7	34	Communication and Conduit		
	35	Communications Subsystem (includes: network switches, patch panels, installation, connections, and integration between communications demarcation and roadside cabinets)	5	
	37	Copper/CAT-6 communication cable (additional footage up to 1 mile)	2000	
	39	PVC Conduit (2", trenched, additional footage up to 1 mile)	1000	
B8	40	Emergency Power and Back-up		
	41	Uninterruptible Power Supply	5	
	42	Emergency Generator (permanently installed)	5	
	44	Subtotal – System Procurement, Installation, and Testing (B1 - B8)		\$ 3,007,661.35
C	45	Project Management and Testing Services		
	46	Project Management	12	
	48	Project Documentation (Project-Level Standalone Documents)	1	
	49	Project Documentation (Program-Level Master Document Updates)	1	
	54	Configuration of Toll Facility Host (Managed Lanes Facilities)	1	
	55	Site Installation Test (ORT and Managed Lanes Facilities)	5	
	57	Integration Test (Managed Lanes Facilities)	5	
	59	Operational Acceptance Test (Managed Lanes Facilities)	5	
	60	Final Operational Acceptance Test (All Facilities)	1	
	61	System As-BUILTs	1	
	62	Subtotal – Project Management and Testing Services		\$ 1,055,858.08
	63	Total – Installation Services (Sections A, B and C)		\$ 4,063,519.43
		10% Contingency		\$ 406,351.94
		Grand Total - Installation Services plus Contingency		\$ 4,469,871.38

ATTACHMENT E

Project Schedule & Milestone Payments ELECTRONIC TOLL COLLECTION SYSTEM INTEGRATION AND MAINTENANCE SERVICES

Milestone Payment Schedule for Phase II - Includes each transitioned or new facility, project documentation, and program documentation updates			
ID	Payment Milestone	% Paid	Cumulative % Paid
B. Hardware and Equipment Ordering and Installation Applies to Section B System Procurement and Installation of Cost Proposal Form			
B-1	Equipment Ordering, Installation, and Testing		
	- Purchased, Received and Verified	10%	10%
	- Start of installation activities	15%	25%
	- Installation activities complete	15%	40%
	- Site Installation Test completed and approved	20%	60%
	- Integration Test completed and approved	20%	80%
	- Operational Acceptance Test completed and approved	20%	100%
C. Project Management, Documentation and Testing Services Applies to Section C Project Management and Testing Services of Cost Proposal Form			
C-1	Project Management Documentation Approval		
	-Work Authorization (Project) Schedule	2.5%	2.5%
	- Project Risk Register		
	- Responsibility Matrix		
	- Updated Roles and Responsibilities		
	- Communication Plan		
C-2	Design Documentation Update Approval		
	- Updated Requirements Traceability Matrix	5.0%	7.5%
	- Updated Master Test Plan		
	- Updated Interface Control Documents		
	- Updated System Detailed Design Documents		
	- Updated Reports Detailed Design Documents		
	- Updated Data Migration Plan (REMOVED FROM SCOPE OF WORK)		

Milestone Payment Schedule for Phase II			
- Includes each transitioned or new facility, project documentation, and program documentation updates			
ID	Payment Milestone	% Paid	Cumulative % Paid
	- Updated Disaster Recovery Plan		
	- Updated Roadside System Flow Diagram		
	- Updated Backup Recovery and Archive Plan		
C-3	Test and Go-Live Planning Documentation Approval		
	- Test Plans and Procedures	5.0%	12.5%
	- Installation Plan (for each new facility)		
	- Transition Plan (for each transitioned facility)		
C-4	Test Results and As-Built Documentation		
	Test Reports	5.0%	17.5%
	As-Built Drawings for each transitioned / new facility		
C-5	Training, Maintenance documentation and Manual Update Approval		
	- Updated Training Plan and Materials	7.5%	25%
	- Updated Roadside System Flow Diagram		
	- Updated Manuals (to all applicable systems)		
	- Updated Maintenance Plan		
	- Updated Inventory (including spares)		
- Updated Succession Plan			
C-7	Configuration of Toll Facility Host	15%	40%
C-8	Site Installation Test completed and approved	15%	55%
C-9	All toll sites commissioned	15%	70%
C-10	Training Completed / Go-Live (start of revenue collection)	15%	85%
C-11	Operational Acceptance Test completed and approved, and Final As-Built drawings representative of any changes made during test and acceptance.	15%	100%

Milestone Payment Schedule for Phase III		
ID	Payment Milestone	Cumulative % Paid
C. Final Documentation		
Applies to Section C Project Management and Testing Services of Cost Proposal Form		
C-60	Test Reports (Test Reports have been approved)	100%
	As-Built Drawings representative of any changes made during test and acceptance (As-Built Drawings from each Work Authorization have been approved)	
	Transition Plan (Verify the Program Transition Plan has been approved and updated as part of each Work Authorization)	
	Program Documentation updates (Verify the Program Documentation has been updated as part of each Work Authorization)	
	Network Diagram updates (Verify network diagrams have been updated with the as-is for those portions of the network that are within the TSI scope of each work authorization.)	
	Inventory (including spares) (Verify the inventory has been provided to CTRMA.)	

ATTACHMENT F

Master Project Schedule and Milestones ELECTRONIC TOLL COLLECTION SYSTEM INTEGRATION AND MAINTENANCE SERVICES

CTRMA WA 4 183N						
ID	WBS	Unique ID	Task Name	Duration	Start	Finish
0	0	0	CTRMA WA 4 183N Project Schedule	743 days	Tue 1/3/23	Fri 12/5/25
2	2	3	Milestones: Payment Schedule	711 days	Fri 2/17/23	Fri 12/5/25
3	2.1	4	B. Hardware Equipment Ordering and Installation	402 days	Thu 5/9/24	Fri 12/5/25
4	2.1.1	5	B-1: Equipment Purchased, Received and Verified	0 days	Thu 5/9/24	Thu 5/9/24
5	2.1.2	6	B-2: Start of Installation Activities	0 days	Tue 2/11/25	Tue 2/11/25
6	2.1.3	7	B-3: Installation Activities Completed	0 days	Mon 6/2/25	Mon 6/2/25
7	2.1.4	8	B-4: Site Installation Test Completed and Approved	0 days	Thu 8/7/25	Thu 8/7/25
8	2.1.5	9	B-5: Integration Test Completed and Approved	0 days	Thu 8/7/25	Thu 8/7/25
9	2.1.6	10	B-6: Operational acceptance Test Completed and Approved	0 days	Fri 12/5/25	Fri 12/5/25
10	2.2	11	C. Project Management, Documentation and Testing Services	711 days	Fri 2/17/23	Fri 12/5/25
11	2.2.1	12	C-1: Project Management Documentation Approved	0 days	Fri 2/17/23	Fri 2/17/23
12	2.2.2	13	C-2: Design Documentation Approved	0 days	Mon 10/30/23	Mon 10/30/23
13	2.2.3	14	C-3: Test and Go-Live Planning Documentation Approved	0 days	Wed 4/9/25	Wed 4/9/25
14	2.2.4	15	C-4: Test Results and As-Built Documentation	0 days	Fri 12/5/25	Fri 12/5/25
15	2.2.5	16	C-5: Training and Manual update Approved	0 days	Tue 7/16/24	Tue 7/16/24
16	2.2.6	18	C-7: Configuration of TFH	0 days	Sat 12/30/23	Sat 12/30/23
17	2.2.7	19	C-8: SIT Completed and Approved	0 days	Thu 8/7/25	Thu 8/7/25
18	2.2.8	20	C-9: All Toll Sites commissioned	0 days	Thu 8/7/25	Thu 8/7/25
19	2.2.9	21	C-10: Training Completed and Go-Live (Start of revenue collection)	0 days	Thu 8/7/25	Thu 8/7/25
20	2.2.10	22	C-11: OAT completed and approved, and Final As-Built Drawings representative of any changes made during test and acceptance	0 days	Fri 12/5/25	Fri 12/5/25
21	3	261	External Dependencies	302 days	Tue 11/28/23	Tue 2/11/25
22	3.1	263	Civil Contractor: Final Site Turnover	0 days	Tue 2/11/25	Tue 2/11/25
23	3.2	264	290 FAT Approval (per approved Baseline 290 schedule)	0 days	Tue 11/28/23	Tue 11/28/23
24	3.3	265	Supply Chain: receipt of last piece of equipment (BOM approval + number of months for longest lead equipment)	0 days	Tue 4/9/24	Tue 4/9/24
25	4	23	Milestones: Liquidated Damages	86 days	Thu 8/7/25	Fri 12/5/25
26	4.1	24	Approval of Site Installation Testing (SIT) at all sites included in this WA by 120 days from the date each site is turned over by	0 days	Thu 8/7/25	Thu 8/7/25
27	4.2	26	Approval of Operational Acceptance Testing (OAT)	0 days	Fri 12/5/25	Fri 12/5/25

ATTACHMENT G

Project Liquidated Damages/Penalties

Liquidated Damages for this WA No. 04

With this WA No. 04, it is agreed by the Parties that time is of the essence. In the event of a delay in completing milestones as set forth in the approved Project Schedule, subject to Mobility Authority-authorized extensions, the Mobility Authority will incur damage, and that it is or will be unfeasible to determine the actual amount of the damage resulting from such delay. As a result, the parties agree the Mobility Authority may impose liquidated damages, as described below, should the SI not meet required milestone dates set forth in the approved Project Schedule.

Note: For the purposes of this section, the use of the term "days" means "calendar days."

Key Project Milestone	Date Associated with LD (Last Approved Schedule)	Associated Liquidated Damages
Approval of Site Installation Testing at all sites included in this WA by 120 days from the date the final site is turned over by Contractor	Based on mutually agreed-upon Civil Contractor and SI final site turnover date + 120 days	<ul style="list-style-type: none"> • \$25,000 for missed milestone • \$5,000/day every day after missed milestone
Approval of Operational Acceptance Testing	Open to Tolling + 6 months	<ul style="list-style-type: none"> • \$1,000/day first 10 days • \$2,500/day next 20 days • \$5,000/day every day after 30th day



CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

December 14, 2022
AGENDA ITEM #12

Discuss and consider approving Work Authorization No. 5 with Electronic Transaction Consultants, LLC (ETC) for the design and installation of the toll system and other infrastructure required to support the 183A Phase III Project

Strategic Plan Relevance:	Innovation, Service and Stewardship
Department:	Operations
Contact:	Greg Mack, Director of Information Technology
Associated Costs:	NTE \$ 2,449,612.35 (includes 10% contingency)
Funding Source:	Not Applicable
Action Requested:	Consider and act on draft resolution

Project Description/Background: Electronic Toll Consultants, LLC was awarded the 2021 RFP for Electronic Toll Collection System (ETCS) Integration and Maintenance Services. The scope of their work in support of the Mobility Authority includes incremental replacement and maintenance of ETCS equipment on all existing Mobility Authority toll projects, as well as implementation and maintenance of systems on new Mobility Authority projects.

Action Requested: Work Authorization (WA) #05 supports the installation of toll equipment on the 183A Phase III Project (“183A Ph. III”) and associated project documentation updates. The 183A Phase III project (“183A Ph. III”) will extend the 183A Toll Road 6.6-miles northward from Hero Way to north of SH 29 in Liberty Hill. The project will consist of the construction of four (4) tolled lanes (two in each direction) located primarily within the existing median of the US 183 corridor, with an adjacent shared use path from Hero Way to Seward Junction Loop. Construction for the 183A Ph. III project commenced in spring 2021 and is anticipated to be completed in the fall of 2024.

The Toll Collection System for the Project will be all electronic toll collection. The Project (183A Ph. III) limits extend from Hero Way to north of SH 29 in Liberty Hill. The Project length is approximately 6.6 miles. The Project consists of ten (10) toll sites that provide open road tolling for both the northbound and southbound lanes and shoulders. A two (2) gantry solution will be provided for all tolling locations.

The total cost for the 183A Phase III toll collection system is \$2,449,612.35. The breakdown for this cost is as follows:

183A Phase III Toll Collection Installation Services Cost Information

System Procurement, Installation and Testing Services	\$ 1,213,209.79
Project Management and Testing Services	1,013,710.52
SUBTOTAL - Installation Services	\$ 2,226,920.31
Project Contingency (10%)	222,692.03
GRAND TOTAL	\$ 2,449,612.35

Previous Actions: In December 2022, the Mobility Authority Board approved the amended and restated contract with Electronic Transaction Consultants, LLC for electronic toll collection integration and maintenance services. The initial term of the agreement is six (6) years with an option for two (2) successive two (2) year renewal terms, subject to the approval of the Mobility Authority’s Board of Directors. The total cost for the agreement is not to exceed \$79,720,455. The value covers all toll collection system installation and maintenance services for new projects as well as existing projects as they are replaced.

In February 2022, the Executive Director approved WA #2 for design support on the 183A Phase III project in an amount not to exceed \$215,648.27.

Financing: 183A Phase III construction financing

Staff Recommendation: Staff recommends the Board approve Work Authorization #5 with Electronic Transaction Consultants, LLC (ETC) for the design and installation of the toll system and other infrastructure required to support the 183A Phase III Project.

Backup provided: ETC Work Authorization #5
Presentation
Draft Resolution

**GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY**

RESOLUTION NO. 22-0XX

**APPROVING WORK AUTHORIZATION NO. 5 WITH
ELECTRONIC TRANSACTION CONSULTANTS, LLC FOR DESIGN AND INSTALLATION
SERVICES RELATED TO THE 183A PHASE III PROJECT ELECTRONIC TOLL
COLLECTION SYSTEM**

WHEREAS, by Resolution No. 22-058 dated December 14, 2022, the Board of Directors approved an Amended and Restated Agreement for Roadside Toll Collection System Installation and Maintenance Services with Electronic Transaction Consultants, LLC (ETC); and

WHEREAS, in the spring of 2021 the Mobility Authority began construction of the 183A Phase III Project which will extend the 183A Toll Road 6.6-miles northward from Hero Way to north of SH 29 in Liberty Hill and will consist of four (4) tolled lanes (two in each direction) located primarily within the existing median of the US 183 corridor, with an adjacent shared use path from Hero Way to Seward Junction Loop; and

WHEREAS, the Mobility Authority requires services necessary to design and install roadway and civil infrastructure enabling operations of the proposed Electronic Toll Collection System (ETCS) and supporting Intelligent Transportation System (ITS) elements for the 183A Phase III Project; and

WHEREAS, the Executive Director and ETC have negotiated draft Work Authorization No. 5 in an amount not to exceed \$2,449,612.35 for services related to the 183A Phase III Project necessary for the design and installation the ETCS and supporting ITS elements; and

WHEREAS, the Executive Director recommends approving Work Authorization No. 5 in the form or substantially the same form as attached hereto as Exhibit A.

NOW THEREFORE, BE IT RESOLVED that the Board of Directors hereby approves Work Authorization No. 5 in an amount not to exceed \$2,449,612.35 with Electronic Transaction Consultants, LLC for services related to the 183A Phase III Project necessary to design and install roadway and civil infrastructure, enabling operations of the proposed Electronic Toll Collection System (ETCS) and supporting Intelligent Transportation System (ITS) elements in the form or substantially the same form attached hereto as Exhibit A.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 14th day of December 2022.

Submitted and reviewed by:

Approved:

James M. Bass
Executive Director

Robert W. Jenkins, Jr.
Chairman, Board of Directors

Exhibit A



CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

WORK AUTHORIZATION

WORK AUTHORIZATION NO. 05 TOLL SYSTEM IMPLEMENTATION – PHASE II and PHASE III

ELECTRONIC TOLL COLLECTION SYSTEM INTEGRATION AND MAINTENANCE SERVICES

THIS WORK AUTHORIZATION (WA) is made this 14th day of December, 2022 pursuant to the terms and conditions of the Agreement for Roadside Toll Collection System Installation and Maintenance Services, to the amended Contract for Toll System Implementation, dated the 14th day of December, 2022 (the “Contract”) entered into by and between the Central Texas Regional Mobility Authority (the “Mobility Authority” or “CTRMA”), and Electronic Transaction Consultants, LLC (the “TSI,” also referred to in attachments to this WA No. 05 as the “System Integrator” or “SI”). WA No. 05 will include the implementation of toll equipment on the 183A Phase III Project (“183A Ph. III”) and associated project documentation updates.

PART I. The TSI shall perform system development, implementation, installation, testing and integration services generally described in the Scope of Work attached hereto as **Attachment A and the Contract**. The TSI’s duties and responsibilities are further detailed in: (1) Project Layouts/Schematics included as **Attachment B**, and (2) the Project Responsibility Matrix included as **Attachment C**

PART II. The maximum amount payable under this WA No. 05 is \$2,449,612.35 including ten percent project contingency. This amount is based generally upon the estimated fees documented in **Attachment D**.

PART III. Payment to the TSI for the services established under this WA No. 05 shall be made in accordance with the Contract.

PART IV. This WA No. 05 shall become effective on the date both parties have signed this WA No. 05. This WA No. 05 will terminate upon the Mobility Authority’s final acceptance of the work described herein as determined by CTRMA or upon payment of the maximum amount payable in Phase II and Phase III, whichever date is first, unless extended as provided by the Contract. The work shall be performed in accordance with the Project Schedule and Milestones as set forth in **Attachment E**.

PART V. This WA No. 05 does not waive any of the parties’ responsibilities and obligations provided under the Contract, as such responsibilities and obligations under the Contract remain in full force and effect.



IN WITNESS WHEREOF, this Work Authorization No. 05 is executed in duplicate counterparts and hereby accepted and acknowledged below.

CTRMA DEPARTMENT DIRECTOR (*Requesting Work Authorization*)

Signature

Date

Typed/Printed Name and Title

CTRMA LEGAL (*Noting Legal Sufficiency*)

Signature

Date

Typed/Printed Name and Title

CTRMA FINANCE (*Noting Funds Availability*)

Signature

Date

Typed/Printed Name and Title

THE TSI (Electronic Transaction Consultants, LLC)

Signature

Date

Typed/Printed Name and Title

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

Executed for and approved by the Central Texas Regional Mobility Authority for the purpose and effect of activating and/or carrying out the orders, established policies or work programs heretofore approved and authorized by the Texas Transportation Commission.

Signature

Date

James Bass, Executive Director

Typed/Printed Name and Title

LIST OF ATTACHMENTS

Attachment A	Work Authorization Scope of Work
Attachment B	Project Layout/Schematics
Attachment C	Project Responsibility Matrix
Attachment D	System Integrator Price Sheet and Budget
Attachment E	Project Schedule & Milestone Payments
Attachment F	Master Project Schedule and Milestones
Attachment G	Project Liquidated Damages/Penalties/Incentives

ATTACHMENT A

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY TOLL SYSTEM IMPLEMENTATION – PHASE II and Phase III

ELECTRONIC TOLL COLLECTION SYSTEM INTEGRATION AND MAINTENANCE SERVICES

WORK AUTHORIZATION SCOPE OF WORK

A1.0 GENERAL

A1.01. Background

Electronic Transaction Consultants, LLC was awarded the 2021 RFP for Electronic Toll Collection System (ETCS) Integration and Maintenance Services. The scope of their work in support of the Mobility Authority includes replacement of ETCS equipment on all existing Mobility Authority toll projects, as well as implementation of new systems on new Mobility Authority projects in the Austin, Texas area. WA No. 05 will include the replacement of toll equipment on 183A Ph. III and associated project documentation updates.

183A Ph. III will extend the 183A Toll Road 6.6-miles northward from Hero Way to north of SH 29 in Liberty Hill. The project will consist of the construction of four (4) tolled lanes (two in each direction) located primarily within the existing median of the US 183 corridor, with an adjacent shared use path from Hero Way to Seward Junction Loop. Construction for the 183A Ph. III project commenced in spring 2021 and is anticipated to be completed in the fall of 2024.

A1.02. Summary Scope of Work

The Scope of Work for WA No. 05 includes all efforts related to Phase II and Phase III of the ETCS Project as described in the Contract. Phase II and Phase III consists of updating all Program-level documentation specific to 183A Ph. III and design, testing, installation, and integration of the ETCS on 183A Ph. III.

A2.0 – GENERAL DESCRIPTION – 183A PH. III INFRASTRUCTURE

The Toll Collection System for the Project will be all electronic toll collection (ETC). Phase II of the Project (183A Ph. III) limits extend from Hero Way to north of SH 29 in Liberty Hill. The Project consists of ten (10) toll sites that provide Open Road Tolling for both the northbound (NB) and southbound (SB) lanes and shoulders. A two (2) gantry solution will be provided for the site at the locations listed in Table 1 below.

Table 1: Gantry Locations and Lane Counts

Toll Zone No.	Approximate Station Location (CL 183A)	Location	Direction of Travel	Type	No. of Lanes	No. of Shoulders (8' or greater)	Comments
1	156+75	North of Trellis Blvd	NB	Ramp	1	1	- One (1) 8' shoulder - One (1) 4' shoulder
2	156+60	North of Trellis Blvd	SB	Ramp	1	1	- One (1) 8' shoulder - One (1) 4' shoulder
3	175+00	North of Larkspur Park Blvd	NB	Mainlane	2	1	- One (1) 10' shoulder - One (1) 6' shoulder
4	175+00	North of Larkspur Park Blvd	SB	Mainlane	2	1	- One (1) 10' shoulder - One (1) 6' shoulder
5	199+00	North of Talon Grasp Tr	NB	Ramp	1	1	- One (1) 8' shoulder - One (1) 4' shoulder
6	198+00	North of Talon Grasp Tr	SB	Ramp	1	1	- One (1) 8' shoulder - One (1) 4' shoulder
7	322+00	South of San Gabriel Pkwy	NB	Ramp	1	0	- One (1) 6' shoulder - One (1) 4' shoulder
8	324+10	South of San Gabriel Pkwy	SB	Ramp	1	0	- Two (2) 4' shoulder
9	335+00	North of Hero Way	NB	Mainlane	2	1	- One (1) 10' shoulder - One (1) 6' shoulder
10	335+00	North of Hero Way	SB	Mainlane	2	1	- One (1) 10' shoulder - One (1) 6' shoulder

A3.0 GENERAL REQUIREMENTS - TOLL COLLECTION SYSTEM

A3.01 General Requirements – 183A Ph. III Toll Collection System

The Scope of Work for WA No. 05 includes implementation of an ETCS for Phase II and Phase III that includes roadside functionality (Automatic Vehicle Identification (AVI), Automatic Vehicle Classification and Detection (AVC/D), Violation Enforcement System (VES), Digital Video Audit System (DVAS)), fiber optic communications, network communication equipment, power systems, and lighting and grounding protection. All field devices will be integrated with the central management software via communication with the Traffic Incident Management Center (TIMC).

The SI shall be responsible for all aspects of system design, testing, procurement, installation/implementation, integration, and training required to support the toll collection system. The ETCS will integrate with the Mobility Authority’s Data Platform System (DPS), which connects to the Mobility Authority’s Pay by Mail system and the Central US Interoperability (CUSIOP) Hub.

The Mobility Authority’s ETCS, which is being designed and implemented through individual and separate work authorizations for each toll road facility, will replace the legacy ETCS that has been implemented on the 183A Toll Road, 290 Toll Road, 71 Toll Lane, 45SW Toll Road, 183 South Toll Road, and the MoPac Express Lane, as well as integrate to the DPS and TIMC. It is required that the ETCS be interoperable with the other CUSIOP agencies through the CUSIOP Hub.

A4.0 EQUIPMENT, INSTALLATION, AND TRANSITION

A4.01. Gantries and Roadside Equipment for ETCS

The SI shall provide, install, and test all equipment, systems, subsystems, documentation, and components to comply with the requirements of Phase II and Phase III of the Contract for the following:

- Roadside systems, subsystems, and infrastructure to support AVI, AVC/D, VES (cameras), DVAS (cameras), , zone controllers, equipment monitoring, diagnostic systems, configuration, software, all related/required components and sensors, validation of roadway infrastructure, including modification of infrastructure (if required), and development of installation drawings and installation plan.
- Appropriate applications to support daily operations of CTRMA’s facilities.
- Processing, tracking, and storing all transactions generated by roadside tolling equipment.
- Complete image processing to provide license plate information from images captured on the roadside, including all systems, and required operations staff.
- Project management including Project schedules, Project meeting organization (including agendas and notes), Project level documentation, requirements workshops,

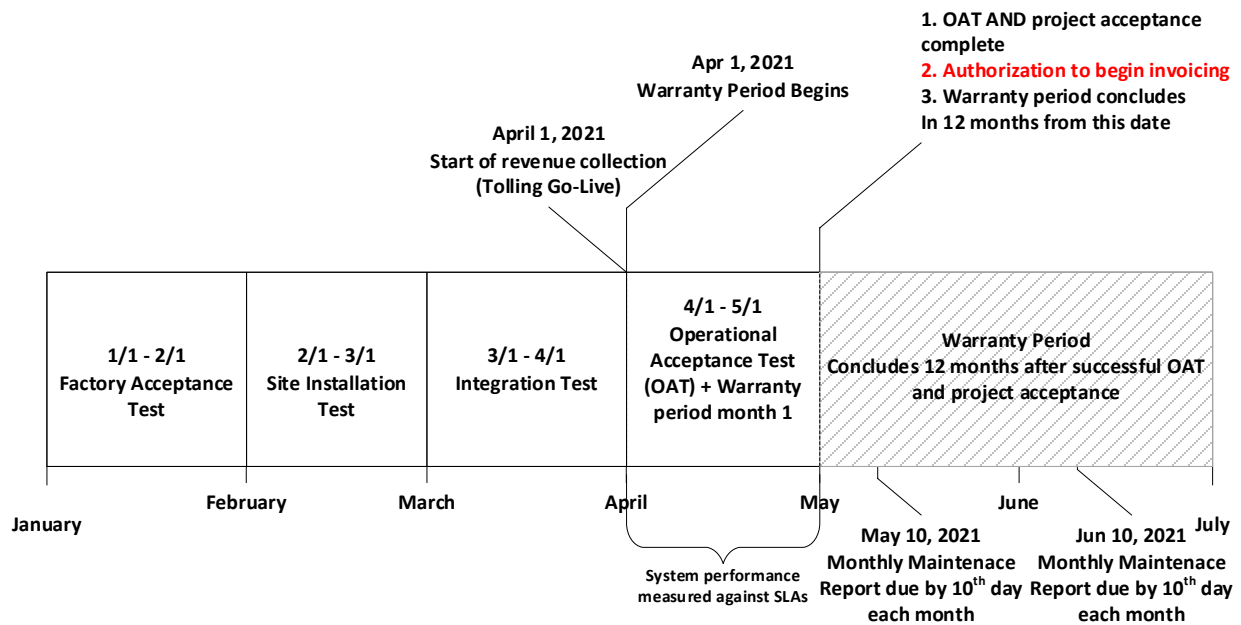
quality assurance and control programs, risk management, and coordination with CTRMA and their designated staff, consultants, partners, and vendors. All documentation is to be submitted to CTRMA for review and approval based on a mutually agreed upon, approved schedule.

- The warranty period concludes 12 months after CTRMA approval of the Operational Acceptance Test (OAT) and project acceptance. An example of the warranty period is presented below in Figure 1 which illustrates the required sequence of each milestone. Additional examples are provided in Section 2.13.6 of Appendix A of the Contract.

The SI shall be given full project acceptance and authorization to initiate maintenance invoicing for the ETCS, either a newly installed or transitioned facility, upon the completion and the CTRMA approval of the OAT for that project/facility, closure of all punch-list items, completion, and submission of all required documents, including as-builts and updates to manuals and meeting of other conditions as specified in the Contract. Work performed prior to authorization to initiate maintenance invoicing is not considered maintenance, even though the project may be open to revenue collection.

Note: Figure 1 represents the completion of OAT and full project acceptance thirty (30) days after go-live.

Figure 1: Example Warranty Period



- Procurement and receipt of all ETCS hardware and coordination with the Mobility Authority for equipment validation and asset tag application.
- Security of all procured and paid for TCS hardware until installed. CTRMA shall receive a full manufacturer’s warranty on all procured hardware equipment during the Warranty Period.

- Development of user manuals and training for SI-provided systems, software, and reports.
- Network administration of all ETCS communications equipment, software, cables, connections, configurations necessary to operate the ETCS.
- Transition plan and approach for the transition of system elements and facilities from the existing SI's solution to the new ETCS, particularly focused on business continuity and mitigation of revenue loss.
- Training program designed to educate CTRMA-designated personnel in the operation, use, and maintenance of the ETCS.
- ETCS Project documentation including the Requirements Traceability Matrix, Interface Control Documents (ICDs), System Detailed Design, Disaster Recovery, and Backup, Recovery and Data Archive plan.
- System testing plan/script and documentation including Master Test Plan, Test Reports, Factory Acceptance Testing, Site Installation Testing, Integration Testing, and Operational Acceptance Testing.
- Succession plan to define the SI's approach in supporting the transition of their responsibilities under this contract to CTRMA and/or another entity whenever this contract terminates.

More detailed requirements for these systems and subsystems are described in Sections 2.4, 2.5, 2.6, 2.9, 2.11, 2.12, 2.13, 2.14, 2.15, 2.17, 2.18, 2.19 of Appendix A of the Contract.

A5.0 PROJECT COORDINATION, MANAGEMENT AND COMMUNICATION

The SI shall be responsible for all required coordination efforts and touchpoints with CTRMA and Project stakeholders throughout the term of the Project, including building and maintaining relationships and direct lines of communication between the Mobility Authority and other Project stakeholders as identified by the Mobility Authority.

Anticipated SI coordination efforts, touchpoints, and responsibilities throughout the Project, include, but are not limited to:

- Project kick-off meeting
- Project progress meetings as required
- Comment resolution meetings to review all submissions, workshops to validate system requirements, design approach and design, product demonstrations, report formats, test plans and scripts, and other issues requiring coordination between CTRMA and the SI.
- Ad-hoc design review meetings
- Design/development demonstrations
- Installation meetings

- Coordination with Kapsch and CTRMA regarding transition of roadways and the transition of maintenance from Kapsch to ETC
- Test script execution and demonstrations
- Coordination with other system providers that integrate to CTRMA's existing ETCS
- OAT readiness meeting and all other testing readiness meetings
- Development of various documents and tools to communicate Project status, installation requirements, or other critical aspects of the Project, including but not limited to:
 - Requirements Traceability Matrix
 - Installation plans and drawings
 - Schedule
- Communicating requirements needed from Mobility Authority and Project stakeholders for system testing

A6.0 TOLL FACILITIES RESPONSIBILITY MATRIX

The delineation of Project responsibilities between the SI and the Mobility Authority is presented in ATTACHMENT C Project Responsibility Matrix.

A7.0 INSTALLATION PERFORMANCE AND PAYMENT BOND

Prior to the beginning of any work designated in this WA No. 05, the TSI shall provide, and continuously maintain in place for the benefit of CTRMA, an installation performance bond and payment bond in the form of Appendix J of the Contract as stipulated in Article 7 of the Contract.

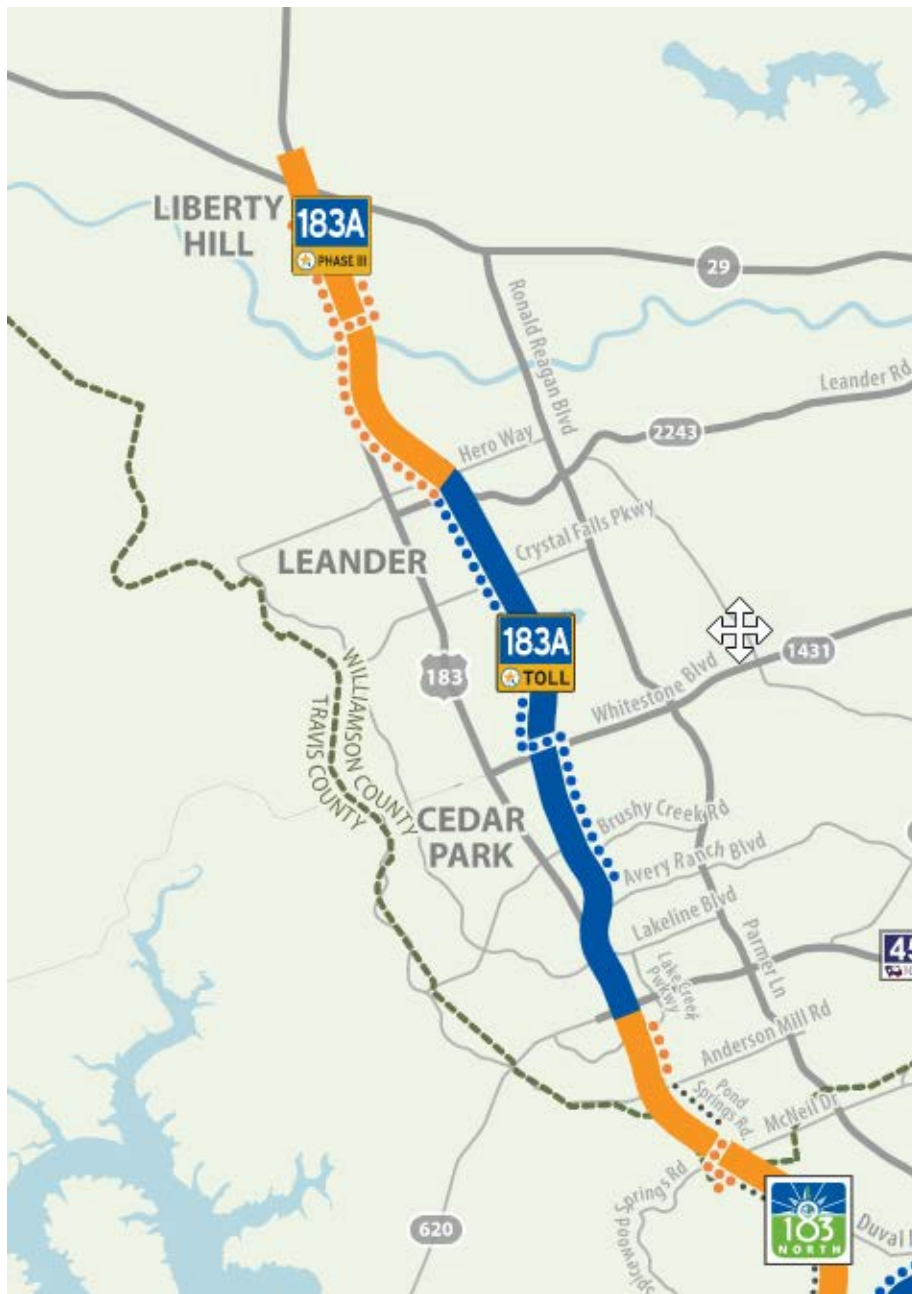
A8.0 INSURANCE

Prior to the beginning of any work designated in this WA No. 05, the TSI shall obtain and furnish Certificates of Insurance (COI) as stipulated in Article 19 of the Contract.

[END OF SECTION]

ATTACHMENT B

Project Layout ELECTRONIC TOLL COLLECTION SYSTEM INTEGRATION AND MAINTENANCE SERVICES



ATTACHMENT C

Project Responsibility Matrix ELECTRONIC TOLL COLLECTION SYSTEM INTEGRATION AND MAINTENANCE SERVICES

Table C-1: Responsibility Matrix for Design Build Contractor (DB) and System Integrator (SI)

Responsibility Assignment Legend							
Primary Responsibility: P	Support Responsibility: S		Coordination Responsibility Only: C			No Responsibility: N	
Element/Task/Component/ Sub-system	Designer/Contractor			Systems Integrator (SI)			Comments Other Responsibility/Information
	Design	Procure	Install/ Construct	Design	Procure	Install/ Construct	
GENERAL REQUIREMENTS							
Schedule	P	P	P	S	S	S	Contractor must accommodate and incorporate the SI scheduled activities into the Contractor schedule. All schedule changes or updates which impact the SI tasks must be agreed to by the SI prior to submittal to the Mobility Authority. A weekly schedule must be distributed and incorporate any SI updates or changes.
Request for Early Opening	P	P	P	S	S	S	SI must be able to match schedule request for early opening to conform to requirements in construction contract documents.
Design Package – Installation and Electrical Design and Plans	P	P	P	C	N	C	Designer to incorporate all SI requirements and specifications into Structural and Electrical Design Packages. SI to provide approval prior to issuance of Released For Construction (RFC) plans.
Grading	P	P	P	C	N	C	
Drainage	P	P	P	C	N	C	No culverts or pipes under tolling zones.
Utilities/Electrical Services	P	P	P	S	C	C	SI to provide specific power requirements for the Toll System. Designer to incorporate into toll facilities design. Contractor to construct power utilities interface, and all power infrastructure. Contractor to provide power to the Toll System pad and ITS locations.
Traffic Control/Safe work zone	P	P	P	S	N	C	SI to provide Contractor detailed lane closure requirements and schedule for installation and testing.
Signing	P	P	P	C	N	N	All toll signing must be coordinated with and approved by the Mobility Authority. If toll price signs utilize changeable electronic signs, the Contractor will provide the static sign and the SI will provide the electronic insert.
Striping	P	P	P	S	N	C	SI to coordinate striping with pavement loop locations.
Lighting	P	P	P	S	C	S	Roadway and toll location lighting designed by Designer and Provided by contractor. SI to provide lighting requirements in vicinity of toll locations

Table C-1: Responsibility Matrix for Design Build Contractor (DB) and System Integrator (SI)

							and locations of other Toll System equipment. Designer to confirm that lighting does not obstruct toll related signing or impede the Toll System.
Landscaping	P	P	P	C	N	N	
Fencing/Guardrail/Bollards/Concrete Barrier	P	P	P	S	C	C	SI to provide requirements for specific equipment clearances for Toll System. Designer to incorporate into roadway design. SI to confirm that design plans meet requirements.
TOLL SYSTEM: LOCATIONS, LAYOUTS, STRUCTURES, MOUNTS/BRACKETS							
Locations and Layouts	P	P	P	S	C	C	SI to provide specific locations for the Toll System, SI to provide requirements for specific lane and facility layouts. Designer to incorporate into Design Packages. SI to review and approve.
Gantries/Foundation/Trusses/Junction boxes/Conduits/Grounding	P	P	P	S	C	S	SI to provide requirements for conduits (for SI installed power and communications cables, including specific requirement for below ground conduits for the loops), junction boxes, and power needs for the Toll System. Designer to incorporate into structural design, including electrical grounding, bonding. Contractor to provide and install junction boxes and conduit pull strings and bell ends for all conduits including conduits going up gantry columns. SI to provide and install conduit in gantry truss. The Contractor will require SI to sign off on belowground conduits for the loops prior to installation of special pavement structure.
Equipment Mounts on Equipment Brackets/Frames	S	N	C	P	P	P	SI to procure and install all Toll System equipment, and related cable & wiring, including communications from roadside cabinets to the equipment mounted on the gantries. SI to provide requirements for all brackets to designer and frames needed to attach SI procured equipment. SI to furnish and install necessary brackets as per requirements.

Table C-1: Responsibility Matrix for Design Build Contractor (DB) and System Integrator (SI)

Equipment Brackets/Frames on Gantries	P	P	P	S	N	C	Contractor to provide and install all brackets and frames needed to attach all SI procured equipment. SI to provide locations for installation to the designer. SI to provide requirements for hanger and orientation of hanger mount to gantries.
Pavement structure, including special nonferrous zones and conduit stub-outs for in-pavement sensors/loops	P	P	P	S	N	C	SI to provide requirements for special pavement structure at toll gantry areas. SI shall coordinate joint spacing to avoid conflicts with loop placement and sign off on riser locations before concrete pour. Designer to assure ferrous objects (i.e. rebar, grates, pipes, etc.) are not in toll revenue collection detection system(s) zone of influence. Contractor to locate loop risers after pavement is poured.
EQUIPMENT CABINETS							
Toll Equipment Cabinets	C	N	S	P	P	P	SI to provide size and number of cabinets needed for Toll System. Designer shall incorporate location into site grading and drainage. SI to procure and install environmentally controlled cabinets. The environmentally controlled enclosures provided by SI must comply with the America Society of Heating, Refrigeration, and Air Conditioning Engineers: Thermal Guidelines for Data Processing Environments. Contractor to provide traffic control devices and safe working conditions for SI during installation of all toll equipment.
Toll Equipment Cabinets Site (TEC) and Roadside Equipment Cabinet Base Slabs	P	P	P	S	N	C	SI to provide requirements for specific equipment weight and anchorages for cabinets to the Designer. Designer to incorporate into Roadway Design. Contractor to install slabs with conduit plumbing.
Facility Security and Security Communications at Toll System locations	C	N	C	P	P	P	SI to provide security communications for all toll system equipment. Designer to incorporate into the Roadway Design. Contractor to provide physical security fence as required by SI around TEC/generators and auxiliary fuel tanks.
TOLL SUB-SYSTEMS							

Table C-1: Responsibility Matrix for Design Build Contractor (DB) and System Integrator (SI)

Automatic Vehicle Identification (AVI) Antennas and Readers	N	N	S	P	P	P	SI to provide AVI System Mounts, Wiring and Cables. SI will perform all AVI system installation and terminations, and to make the connections to the electronics in the cabinets.
Automatic Vehicle Classification and Detection (AVC) and (AVD)	N	N	S	P	P	P	SI to connect and terminate AVC and/or AVD System mounted on the gantries and/or installed in the pavement to the electronics in the cabinets.
In-Pavement Sensors/Loops	N	N	S	P	P	P	SI to saw cut pavement, procure, install, and seal pavement sensors with approved sealant. Designer to assure ferrous objects (i.e. rebar, grates, etc.) are not in toll collection detection system(s) zone of influence. Contractor to assure longitudinal and Transverse pavement joints in the non-ferrous pavement section in the Toll Zone do not conflict with SI conduit stub-up array in pavement section.
Video Capture Sub-System (VCS/VES) Cameras, Illumination, Sensors and Servers	N	N	S	P	P	P	SI to provide, install, terminate all Video Capture Sub-System (VCS/VES) equipment.
In-Lane Processing Servers and Electronics	N	N	N	P	P	P	SI to provide, install, connect, and terminate all electronics in the cabinet and assures proper communications to the devices on the gantry and/or in the pavement.
POWER DISTRIBUTION SUB-SYSTEM							
Metered power service at each location	P	P	P	C	N	C	SI to provide power requirements and special requirements for construction of utilities near each Toll System. Designer should incorporate requirements into roadway design. Contractor to provide and install necessary conductors, ducts & junction/pull boxes, bell ends/pull strings and disconnect switch/fuse at the meter.
Power service at each toll location	C	N	C	P	P	P	The SI shall provide and install all other wiring, switches, surge protection/suppression, etc. for power from the meter for the Toll System equipment. SI will terminate all power wiring for all branch circuits off the Service Panel to the Toll Site.

Table C-1: Responsibility Matrix for Design Build Contractor (DB) and System Integrator (SI)

Generators & Automatic Transfer Switches (ATS)	S	N	C	P	P	P	SI to provide generators, ATS, generator cabinets, wiring, connect and terminate all power at the Toll System sites.
Generator Power Source is Natural Gas	P	P	P	S	N	C	If natural gas is available, the Designer shall incorporate the gas lines into the roadway design. Contractor shall provide and install gas lines for incorporation into generator systems. SI to coordinate and provide generator requirements including location for gas feed including location of gas cut-off valve adjacent to Toll Pad. SI to install feed from generator to cut-off valve.
Generator Power Source is propane or diesel	S	S	S	P	P	P	The SI shall provide and install the propane/diesel tank for the generator if natural gas is not a viable option for the project. If propane is used, contractor will provide pad and conduit feed from the pad to the cut-off valve. Feeder line cut-off valve to be no further than 10' from the toll pad.
Uninterruptible Power Supplies (UPS)	S	N	C	P	P	P	SI to provide and install Uninterruptible Power Supply Systems (UPS) in the cabinets. UPS will be required for the Toll System,
Lightning Protection & Grounding	P	P	P	S	C	C	SI to provide specific requirements for equipment lightning protection and grounding. Designer should incorporate into plans. Contractor to furnish and install required lightning protection and grounding.
COMMUNICATIONS SUB-SYSTEMS							
Conduits/Ducts & Junction/Pull Boxes/Outlets	P	P	P	S	C	S	SI to provide specific Communications design requirements including location of long-radius sweep conduit bends. Designer to incorporate into the roadway design and contractor to install including conduits, junction boxes and bell ends with pull strings. The Contractor shall verify that all duct banks and conduits are clear/proofed and have pull strings prior to the beginning of the Toll System installation.

Table C-1: Responsibility Matrix for Design Build Contractor (DB) and System Integrator (SI)

Fiber Optic cabling in conduits for Toll System	S	S	S	P	P	P	SI to provide fiber requirements for Toll System. Designer to incorporate into design of backbone and laterals. SI to furnish and install along the corridor from communication
Toll Hardware in Cabinets	C	N	C	P	P	P	SI to provide and install all toll hardware within the cabinets. Equipment must be installed in a clean and organized manner and must not be affected by
Routers	C	N	C	P	P	P	SI to provide, install and configure the routers for connection from hub locations to the Mobility
Hubs	N	N	C	P	P	P	If applicable.
Switches	N	N	C	P	P	P	SI to provide, install and configure the switches for connection from hub locations to the Mobility
Firewalls	N	N	C	P	P	P	SI to provide, install and configure the necessary firewall for the toll system
Patch/Distribution Panels	N	N	C	P	P	P	SI to provide and install all the necessary patch and distribution panels to provide Fault Tolerant Single Mode Fiber Optic IP-Based Communication
Corridor Communications System	S	N	C	P	P	P	SI to provide Fault Tolerant Single Mode Fiber Optic IP-Based Communication System for Toll Revenue Collection Systems.
Corridor Communications Conduits	P	P	P	C	N	S	Designer to design for any branch off existing duct bank system including conduit, ground boxes and terminations. Contractor to furnish and install.
Corridor to Traffic Management Center(TMC)	N	N	N	P	P	P	SI to provide Fault Tolerant IP-Based Communication System to the TMC for Toll Revenue Collection Systems.
Data/Communications Service to each Tolling Location	N	P	P	P	P	P	SI to install any power and communications cable required to interface between the TEC and the service provider's POI. Contractor responsible for conduit, ground boxes and infrastructure terminations. Contractor is responsible for the conduit infrastructure to provide a raceway from the Toll Pad to the Service POI.
SYSTEMS SERVERS AND SPACE							
Toll Collection Systems Computer(s)	N	N	N	P	P	P	

Table C-1: Responsibility Matrix for Design Build Contractor (DB) and System Integrator (SI)

Support Equipment at CTRMA Offices	N	N	N	P	P	P	SI to provide data and power wiring schematics, equipment rack/cabinet requirement, and elevations, layouts, floor plans, air flow diagrams, and environmental controls load calculations, electrical power distribution, including grounding, bonding, lightning protection, panel boards, TVSS, circuit breakers conduit, conductors, j-boxes, receptacles.
Systems Servers & Workstations	N	N	C	P	P	P	SI to provide, install and configure all system servers and workstations required at the TMC to support the operations and management of the Project.
Federal Communication Commission License Preparation and Submission	C	N	N	P	P	P	SI to provide all information necessary to acquire FCC Licensing to the Mobility Authority.
DUCT BANK & INTELLIGENT TRANSPORTATION SYSTEMS (ITS) – TXDOT OWNED							
Duct Bank Adjustment & ITS relocations design	P	P	P	N	N	N	Designer is responsible for the design of any necessary ITS relocations including, foundations, conduits, electrical services, grounding circuits, and support structures. Contractor responsible for notifying designer of adjustments needed to any existing duct bank manholes and providing new junction/boxes and manholes if in conflict with the project. Coordination with TxDOT will be required. SI responsible for adjustments to 290E fiber.
Duct Bank Adjustments/new connections	P	P	P	S	N	C	Designer is responsible for designing all manhole adjustments and new manhole ties. Contractor responsible to furnish/install
Fiber optic cables	N	N	N	P	P	P	Any adjustments to existing 290E cables are SI responsibility.
Relocation of existing CCTV & DMS foundations, conduits, grounding, camera poles, and electrical services	P	P	P	C	N	C	Designer is responsible for designing the relocation of any existing CCTV and DMS structures and services impacted by the Project Design, including communications and power. Contractor shall be responsible for relocating aforementioned structures/services. Damaged or inoperable equipment shall be moved but not repaired. Coordinate with TxDOT in regards to proper storage of existing devices until time of reinstall.
Relocation of RVSD Stations	P	P	P	C	C	C	Contractor to coordinate with SI for relocation of CTRMA devices and infrastructure related to RVSD.

Table C-1: Responsibility Matrix for Design Build Contractor (DB) and System Integrator (SI)

Relocation of vehicle detector foundations, conduits, loops, grounding, vehicle detector support structures, and electrical services	P	P	P	C	N	C	Designer to coordinate with TxDOT regarding any existing vehicle detectors/loops within the pavement to determine if they will need to be replaced/relocated. The Contractor will replace/relocate detectors/loops unless TxDOT prefers to do the work. Any damaged detectors/loops that are to remain must be replaced by the Contractor. Coordinate with TxDOT in regard to proper storage of existing devices until time of reinstall.
DUCT BANK & INTELLIGENT TRANSPORTATION SYSTEMS (ITS) – PROPOSED							
Duct Bank	P	P	P	S	N	C	Designer responsible for the design of any new duct bank.
Conduit/Ducts & Junction/Pull Boxes/Outlets	P	P	P	S	C	S	
CCTV Poles and foundations	P	P	P	S	N	C	CCTV poles shop drawing to be reviewed by SI prior to release for fabrication. Design to provide all elements of lightning protection as noted in TxDOT CCTV Pole details. Drilled shafts for
RVSD Poles and foundations	P	P	P	S	N	C	RVSD poles shop drawing to be reviewed by SI prior to release for fabrication.
DMS Support Structures	P	P	P	S	N	C	DMS support structure shop drawings to be reviewed by SI prior to release for fabrication. Designer to provide all elements of lightning protection as noted in TxDOT
Fiber Optic Cable	N	N	S	P	P	P	
CCTV Cameras and control equipment	N	N	S	P	P	P	
RVSD and control equipment	N	N	S	P	P	P	
DMS and control equipment	N	N	S	P	P	P	
Metered power service at each location	P	P	P	C	N	C	ITS devices that cannot be pulled off a toll power panel (Generator Backup) will require a dedicated service drop. SI to provide a list of ITS devices which can be fed from proposed or existing toll power panels.

Table C-2: Responsibility Matrix for CTRMA and System Integrator (SI)

Responsibility Assignment Legend							
Primary Responsibility: P	Support Responsibility: S		Coordination Responsibility Only: C			No Responsibility: N	
Element/Task/Component/ Sub-system	CTRMA			Systems Integrator (SI)			Comments Other Responsibility/Information
	Design	Procure	Install/ Construct	Design	Procure	Install / Construct	
GENERAL REQUIREMENTS							
Project Management and Documentation	C	N	N	P	P	P	SI responsible for developing all required documentation deliverables by the agreed upon schedule dates, building in time to allow the CTRMA adequate time to review and approve documents, and submitting them for CTRMA’s review and approval. CTRMA to provide approval of documents prior to system design.
System Design Documents	S	N	N	P	P	P	SI responsible for developing all required documentation deliverables by the agreed upon schedule dates, building in time to allow the CTRMA adequate time to review and approve documents, and submitting them for CTRMA’s review and approval. CTRMA to provide approval of design packages prior to system testing and implementation.
Schedule	S	N	N	P	P	P	The SI is responsible for developing a comprehensive project schedule capturing all work items and activities needed to fully implement the toll system. The SI shall be responsible for updating and distributing an updated schedule monthly (or upon a duration as directed by CTRMA) that incorporates any SI updates or changes from the last schedule update. The SI shall be responsible for coordinating with outside entities or other project stakeholders, as determined by the Mobility Authority, to incorporate third-party tasks into the SI’s schedule that may impact delivery of the toll system

Table C-2: Responsibility Matrix for CTRMA and System Integrator (SI)

ELECTRONIC TOLL COLLECTION SYSTEM							
Determination of existing toll equipment, infrastructure, buildings, and communication reuse	C	C	C	P	P	P	Unless explicitly stated otherwise, the SI may reuse any or all equipment currently installed, subject to the limitations of the approved transition plan.
Toll Equipment	S	N	S	P	P	P	SI to provide all tolling equipment. If SI reusing existing toll equipment, SI shall certify existing equipment will meet all required SLAs. SI is responsible for all aspects of the design, development, testing and implementation of the toll equipment as described in the master contract and this WA No. 05.
Data Platform System (DPS)	S	N	S	P	P	P	SI to integrate with CTRMA's DPS for transmission and reconciliation of toll transactions and images, as described in the master contract, this WA No. 05 or third-party system design documents (i.e., ICDs)
Transition of Facilities	N	N	C	P	P	P	SI to submit a Transition Plan to CTRMA for review, comment, and approval before the start of any transition activities.
Testing	S	N	C	P	P	P	SI to conduct testing of the ETCS to validate functionality, availability, reliability, accuracy, and compliance to the requirements detailed in Appendix A of the Contract or changes to any requirements due to change orders or break/fix activities. The SI is responsible for documenting all test plans and procedures/scripts and submitting them for the Mobility Authority's review and approval prior to testing.
Training	S	N	C	P	P	P	SI to provide training designed to educate CTRMA-designated personnel in the operation, use, and maintenance of the ETCS. The SI is responsible for all training documents and materials as described in the master contract and submitting them for the Mobility Authority's review and approval prior to training.

ATTACHMENT D

System Integrator Price Sheet

ELECTRONIC TOLL COLLECTION SYSTEM INTEGRATION AND MAINTENANCE SERVICES

SECTION / LINE		DESCRIPTION	WA 5 Quantity	WA 5 Price
B2	16	Open Road Toll Collection – Future Facilities/New Construction w/ In-Ground		
	18	One lane + one shoulder	4	
	19	Two lanes (no shoulder)	1	
B4	27	Plaza Server		
	28	Plaza Server	1	
B5	29	ORT Roadside Equipment Cabinet		
	30	Toll Zone	5	
B7	34	Communication and Conduit		
	35	Communications Subsystem (includes: network switches, patch panels, installation, connections, and integration between communications demarcation and roadside cabinets)	5	
	37	Copper/CAT-6 communication cable (additional footage up to 1 mile)	2000	
	39	PVC Conduit (2", trenched, additional footage up to 1 mile)	2000	
B8	40	Emergency Power and Back-up		
	41	Uninterruptible Power Supply	5	
	42	Emergency Generator (permanently installed)	5	
	44	Subtotal – System Procurement, Installation, and Testing (B1 - B8)		\$ 1,213,209.79
C	45	Project Management and Testing Services		
	46	Project Management	12	
	48	Project Documentation (Project-Level Standalone Documents)	1	
	49	Project Documentation (Program-Level Master Document Updates)	1	
	53	Configuration of Toll Facility Host (ORT Facilities)	1	
	55	Site Installation Test (ORT and Managed Lanes Facilities)	5	
	56	Integration Test (ORT Facilities)	5	
	58	Operational Acceptance Test (ORT Facilities)	5	
	60	Phase III Documentation	1	
	61	System As-Builts	1	
	62	Subtotal – Project Management and Testing Services		\$ 1,013,710.52
	63	Total – Installation Services (Sections A, B and C)		\$ 2,226,920.31
		10% Contingency		\$ 222,692.03
		Grand Total - Installation Services plus Contingency		\$ 2,449,612.35

ATTACHMENT E

Project Schedule & Milestone Payments ELECTRONIC TOLL COLLECTION SYSTEM INTEGRATION AND MAINTENANCE SERVICES

Milestone Payment Schedule for Phase II - Includes each transitioned or new facility, project documentation, and program documentation updates			
ID	Payment Milestone	% Paid	Cumulative % Paid
B-1	Equipment Ordering, Installation, and Testing		
	- Purchased, Received and Verified	10%	10%
	- Start of installation activities	15%	25%
	- Installation activities complete	15%	40%
	- Site Installation Test completed and approved	20%	60%
	- Integration Test completed and approved	20%	80%
	- Operational Acceptance Test completed and approved	20%	100%
C. Project Management, Documentation and Testing Services Applies to Section C Project Management and Testing Services of Cost Proposal Form			
C-1	Project Management Documentation Approval		
	-Work Authorization (Project) Schedule	2.5%	2.5%
	- Project Risk Register		
	- Responsibility Matrix		
	- Updated Roles and Responsibilities		
- Communication Plan			
C-2	Design Documentation Update Approval		
	- Updated Requirements Traceability Matrix	5.0%	7.5%
	- Updated Master Test Plan		
	- Updated Interface Control Documents		
	- Updated System Detailed Design Documents		
	- Updated Reports Detailed Design Documents		
	- Updated Data Migration Plan (REMOVED FROM SCOPE OF WORK)		
	- Updated Disaster Recovery Plan		
- Updated Roadside System Flow Diagram			

Milestone Payment Schedule for Phase II			
- Includes each transitioned or new facility, project documentation, and program documentation updates			
ID	Payment Milestone	% Paid	Cumulative % Paid
	- Updated Backup Recovery and Archive Plan		
Test and Go-Live Planning Documentation Approval			
C-3	- Test Plans and Procedures	5.0%	12.5%
	- Installation Plan (for each new facility)		
	- Transition Plan (for each transitioned facility)		
Test Results and As-Built Documentation			
C-4	Test Reports	5.0%	17.5%
	As-Built Drawings for each transitioned / new facility		
Training, Maintenance documentation and Manual Update Approval			
C-5	- Updated Training Plan and Materials	7.5%	25%
	- Updated Roadside System Flow Diagram		
	- Updated Manuals (to all applicable systems)		
	- Updated Maintenance Plan		
	- Updated Inventory (including spares)		
	- Updated Succession Plan		
C-7	Configuration of Toll Facility Host	15%	40%
C-8	Site Installation Test completed and approved	15%	55%
C-9	All toll sites commissioned	15%	70%
C-10	Training Completed / Go-Live (start of revenue collection)	15%	85%
C-11	Operational Acceptance Test completed and approved, and Final As-Built drawings representative of any changes made during test and acceptance.	15%	100%

Milestone Payment Schedule for Phase III		
ID	Payment Milestone	Cumulative % Paid
C. Final Documentation		
Applies to Section C Project Management and Testing Services of Cost Proposal Form		
C-60	Test Reports (Test Reports have been approved)	100%
	As-Built Drawings representative of any changes made during test and acceptance (As-Built Drawings from each Work Authorization have been approved)	
	Transition Plan (Verify the Program Transition Plan has been approved and updated as part of each Work Authorization)	
	Program Documentation updates (Verify the Program Documentation has been updated as part of each Work Authorization)	
	Network Diagram updates (Verify network diagrams have been updated with the as-is for those portions of the network that are within the SI scope of each work authorization.)	
	Inventory (including spares) (Verify the inventory has been provided to CTRMA.)	

ATTACHMENT F

Master Project Schedule and Milestones ELECTRONIC TOLL COLLECTION SYSTEM INTEGRATION AND MAINTENANCE SERVICES

WA 5 183A PH III						
ID	WBS	Unique ID	Task Name	Duration	Start	Finish
0	0	0	183A PHIII WA 5	453 days	Tue 1/3/23	Fri 10/18/24
2	2	2	Milestones: Payment Schedule	421 days	Fri 2/17/23	Fri 10/18/24
3	2.1	3	B. Hardware Equipment Ordering and Installation	328 days	Mon 7/3/23	Fri 10/18/24
4	2.1.1	4	B-1: Equipment Purchased, Received and Verified	0 days	Mon 7/3/23	Mon 7/3/23
5	2.1.2	5	B-2: Start of Installation Activities	0 days	Mon 1/8/24	Mon 1/8/24
6	2.1.3	6	B-3: Installation Activities Completed	0 days	Tue 4/30/24	Tue 4/30/24
7	2.1.4	7	B-4: Site Installation Test Completed and Approved	0 days	Fri 7/5/24	Fri 7/5/24
8	2.1.5	8	B-5: Integration Test Completed and Approved	0 days	Fri 7/5/24	Fri 7/5/24
9	2.1.6	9	B-6: Operational acceptance Test Completed and Approved	0 days	Fri 10/18/24	Fri 10/18/24
10	2.2	10	C. Project Management, Documentation and Testing Services	421 days	Fri 2/17/23	Fri 10/18/24
11	2.2.1	11	C-1: Project Management Documentation Approval	0 days	Fri 2/17/23	Fri 2/17/23
12	2.2.2	12	C-2: Design Documentation Approval	0 days	Tue 4/18/23	Tue 4/18/23
13	2.2.3	13	C-3: Test and Go-Live Planning Documentation Approval	0 days	Fri 7/7/23	Fri 7/7/23
14	2.2.4	14	C-4: Test Results and As-Built Documentation	0 days	Fri 10/18/24	Fri 10/18/24
15	2.2.5	15	C-5: Training and Manual update Approval	0 days	Tue 6/27/23	Tue 6/27/23
16	2.2.6	17	C-7: Configuration of TFH	0 days	Tue 6/6/23	Tue 6/6/23
17	2.2.7	18	C-8: SIT Completed and Approved	0 days	Fri 7/5/24	Fri 7/5/24
18	2.2.8	19	C-9: All Toll Sites commissioned	0 days	Fri 7/5/24	Fri 7/5/24
19	2.2.9	20	C-10: Training Completed and Go-Live (Start of revenue collection)	0 days	Fri 7/5/24	Fri 7/5/24
20	2.2.10	21	C-11: OAT completed and approved, and Final As-Built Drawings representative of any changes made during test and acceptance	0 days	Fri 10/18/24	Fri 10/18/24
21	3	265	External Dependencies	148 days	Sat 6/3/23	Sat 1/6/24
22	3.1	267	Civil Contractor: Final Site Turnover	0 days	Sat 1/6/24	Sat 1/6/24
23	3.2	268	290 FAT Approval (per approved Baseline 290 schedule)	0 days	Tue 11/28/23	Tue 11/28/23
24	3.3	269	Supply Chain: receipt of last piece of equipment (BOM approval + number of months for longest lead equipment)	0 days	Sat 6/3/23	Sat 6/3/23
25	4	22	Milestones: Liquidated Damages	74 days	Fri 7/5/24	Fri 10/18/24
26	4.1	23	Approval of Site Installation Testing (SIT) at all sites included in this WA by 120 days from the date each site is turned over by Contractor	0 days	Fri 7/5/24	Fri 7/5/24
27	4.2	25	Approval of Operational Acceptance Testing (OAT)	0 days	Fri 10/18/24	Fri 10/18/24

ATTACHMENT G

Project Liquidated Damages/Penalties

Liquidated Damages for this WA No. 05

With this WA No. 05, it is agreed by the Parties that time is of the essence. In the event of a delay in completing milestones as set forth in the approved Project Schedule, subject to Mobility Authority-authorized extensions, the Mobility Authority will incur damage, and that it is or will be unfeasible to determine the actual amount of the damage resulting from such delay. As a result, the parties agree the Mobility Authority may impose liquidated damages, as described below, should the SI not meet required milestone dates set forth in the approved Project Schedule.

Note: For the purposes of this section, the use of the term "days" means "calendar days."

Key Project Milestone	Date Associated with LD (Last Approved Schedule)	Associated Liquidated Damages
Approval of Site Installation Testing at all sites included in this WA by 120 days from the date the final site is turned over by Contractor	Based on mutually agreed-upon Civil Contractor and SI final site turnover date + 120 days	<ul style="list-style-type: none"> • \$25,000 for missed milestone • \$5,000/day every day after missed milestone
Approval of Operational Acceptance Testing	Open to Tolling + 6 months (calendar days)	<ul style="list-style-type: none"> • \$1,000/day first 10 days • \$2,500/day next 20 days • \$5,000/day every day after 30th day



CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

December 14, 2022
AGENDA ITEM #13

Executive Director Board Report

Strategic Plan Relevance: Stewardship, Collaboration, Innovation, Service & Safety

Department: Executive

Contact: James M. Bass, Executive Director

Associated Costs: N/A

Funding Source: N/A

Action Requested: Briefing and Board Discussion Only

Project Description/Background:

Executive Director Report.

- A. Mobility Authority office plan.
- B. Agency performance metrics.
 - (i) Roadway performance
 - (ii) Call-Center performance

Backup provided: None



CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

December 14, 2022
AGENDA ITEM #14

Executive Session

Executive Session:

Discuss the sale, transfer, or exchange of one or more parcels or interests in real property owned by the Mobility Authority and related legal issues as authorized by §551.071 (Consultation with Attorney) and §551.072 (Deliberation Regarding Real Property; Closed Meeting).



CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

December 14, 2022
AGENDA ITEM #15

Executive Session

Executive Session:

Discuss legal issues related to claims by or against the Mobility Authority; pending or contemplated litigation and any related settlement offers; or other matters as authorized by §551.071 (Consultation with Attorney).



CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

December 14, 2022
AGENDA ITEM #16

Executive Session

Executive Session:

Discuss legal issues relating to procurement and financing of Mobility Authority transportation projects and toll system improvements, as authorized by §551.071 (Consultation with Attorney).



CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

December 14, 2022
AGENDA ITEM #17

Executive Session

Executive Session:

Discuss personnel matters as authorized by §551.074 (Personnel Matters).



CENTRAL TEXAS REGIONAL
MOBILITY AUTHORITY

December 14, 2022
AGENDA ITEM #18

Adjourn Meeting

Adjourn Board Meeting.